

CPH FinTech Hub

Study and recommendations for making Copenhagen a Nordic FinTech hub
Full report



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CPH FINTECH HUB

Purpose of the study

The City of Copenhagen, the Financial Services Union Denmark (Finansforbundet), the Danish Bankers Association (Finansrådet), Nets, Saxo Bank, the Association of Danish Lawyers and Economists (DJØF), BEC, TRYG and CFIR (Copenhagen Fintech Innovation & Research) have commissioned the present study investigating Copenhagens potentials for becoming a strong Nordic FinTech Hub. The study maps and assesses both strengths and weaknesses of the Danish and the Copenhagen FinTech ecosystem and comes with recommendations of what actions and initiatives that should be taken in order to unlock the potential and make Copenhagen a leading Nordic FinTech hub.

The study has been carried out by Oxford Research and RainmakingInnovation from September to December 2015.

About RainmakingInnovation

RainmakingInnovation has a broad and global knowledge and concrete experience with innovation, start-ups and the financial services industry.

RainmakingInnovation has experience with designing and carrying out start-up ecosystem development projects and to facilitate accelerators invest in start-ups and support some of the world's leading companies with internal and external innovation.

About Oxford Research

Knowledge for a better society

Oxford Research is a specialized knowledge company focusing on the areas of industrial and regional development and welfare

Within these areas, we work with knowledge and innovation systems, development of municipalities and regions, and social, educational, and labour market policies.

Oxford Research carries out evaluations and analyses, and offers consultancy on strategy. We also pass on our knowledge at different kinds of seminars.

We combine academic depth, excellent communication and strategic understanding.

1. Executive summary

FinTech – digital financial technologies – is currently reshaping the development and future of the financial services sector by disrupting financial services and products, much in the way that similar digital technologies have reshaped other industries like publishing, music, tourism and taxis in recent years. **FinTech is seeing exponential growth, and the level of global FinTech investments in start-ups have more than tripled in the last five years** from DKK 5.6bn in 2008 to DKK 17.8bn in 2013¹. At the same time, FinTech innovation is also moving jobs from traditional financial services to the new digital domain at a high speed, making it **a burning platform for the established players in the financial services sector**.

On this background, the City of Copenhagen together with the Financial Services Union Denmark (Finansforbundet), the Danish Bankers Association (Finansrådet), Nets, Saxo Bank, the Association of Danish Lawyers and Economists (DJØF), BEC, TRYG and CFIR (Copenhagen Fintech Innovation & Research) have commissioned **the present study investigating Copenhagen's potentials for becoming a strong Nordic FinTech Hub**. The study maps and assesses both strengths and weaknesses of the Danish and the Copenhagen FinTech ecosystem and comes with recommendations of what actions and initiatives that should be taken in order to unlock the potential and make Copenhagen a leading Nordic FinTech hub.

The study has been carried out by Oxford Research and RainmakingInnovation from September to December 2015. The analysis is based on a combination of international literature review, in depth interview with Danish and international FinTech experts, consultation of more than 80 Danish FinTech stakeholders through six workshops, web based surveys with companies and experts and eight case studies of international FinTech hubs.

The Danish FinTech scene – home to more than 14,000 employees

The Danish FinTech sector employs around 14,000 people. To give a comparative idea of the FinTech sector's size, this is almost three times as many employees as in the Danish design industry, twice as many as in architecture and one-third more employees than in the energy sector². The vast majority is employed in the established part of the sector at either the financial service providers (banks, insurance companies, pension funds, mortgage lenders) or the sub-suppliers of IT and technology (96% of the FinTech workforce), while the start-ups only employ 4% (around 550 people).

The sector is made up of 368 companies and is characterized by a dominance and strong presence of established players, while the start-ups scene is relatively modest. Large companies such as Nordea, Danske Bank, TRYG, Saxo Bank and PensionDanmark dominate the financial services sector, while the IT and technology sub-suppliers are represented by large international companies such as Nets, IBM, Microsoft, SimCorp, Logica, Accenture and CSC.

Considerable growth rates in the Danish FinTech sector is expected, and the Danish FinTech companies generally expect an increase of FinTech employees within the next five years of more than 5,000 people altogether. However, as will be explained, the study shows that a joined and focused effort is needed in order to actually leverage this potential.

¹ Accenture: The Boom in Global FinTech Investment – A growth opportunity for London (2014)

² Regstat (Erhvervsstyrelsen) 2015 and Kreative Erhverv og Design, Region Syddanmark 2014

Copenhagen holds the potentials to become a Nordic FinTech Hub

In a European and global context, Copenhagen is not positioned as a FinTech hub today, but as this analysis shows, **the emergence of FinTech represents a great growth opportunity and potential for Copenhagen and Denmark.** Copenhagen has recently been ranked number five in the European Digital City Index 2015³ looking into the strengths and weaknesses of the local startup ecosystem. Due to a well-developed digital infrastructure, a high level of e-readiness and relatively low costs of living and an inexpensive workforce compared to other digital and financial hotspots such as Silicon Valley, New York and London, Copenhagen is an easy and attractive place for doing business. Additionally, Copenhagen is generally perceived to be among the most well designed and one of the most liveable cities in the world, and the culture for collaboration between businesses and public authorities is highlighted as a unique Danish feature that opens up for creating new and durable digital solutions. Last but not least, the analysis points out that Denmark has traditionally had a high level of innovation and tech readiness within the financial services sector with close links to the established suppliers of IT and technology.

Significant action is needed

However, the path to becoming a leading Nordic FinTech hub is not clear-cut, as **Copenhagen faces a number of clear challenges and barriers that need to be addressed.** Copenhagen still has a rather small and relatively scattered FinTech eco-system where the different players (start-ups, investors, established players and public institutions) could work more closely together. Not many established players are driving significant innovation programs, and FinTech companies also lack a closer relationship to the regulatory bodies and a stronger commitment from politicians to drive the FinTech agenda. The largest weakness of the Danish FinTech ecosystem compared to successful international FinTech hubs however, is a weak and modest start-up scene. Having a large and vibrant start-up scene is crucial for being a strong FinTech hub. Our research shows that innovation and job creation in FinTech is to a high degree, driven by start-ups and young companies today. Further, the race is on – both within the Nordics and across Europe where cities like London, Stockholm, Amsterdam and Zurich are already well ahead of Copenhagen. If we do not take action now, Copenhagen is likely to have lost the FinTech train for good.

What needs to be done?

A strong ambition and will to do something is necessary, if Copenhagen wants to become a leading Nordic FinTech hub. It is about doing it BIG and FAST, and in order to succeed the public and private players need to join forces and all initiatives should build on and supplement existing initiatives and platforms. We have identified six overall key enablers to build Copenhagen as a Fintech hub:

1. A vibrant FinTech community
2. Active established players
3. Access to risk capital
4. Political support and a friendly regulator
5. Access to talent
6. Brand as a FinTech hub

Within these six key enablers we have specified 17 concrete recommendations. These recommendations are based on what we have learned - by looking at international benchmarks - have been key success factors for building international FinTech hubs. In addition, these recommendations aim to address Copenhagen's relative weaknesses and key strengths as identified in this report. In order to develop and establish Copenhagen as a leading Nordic FinTech hub,

³ <https://digitalcityindex.eu/>

the study shows the entire FinTech ecosystem needs to be strengthened. From this outset, the majority of the recommendations are targeted the development of a stronger FinTech start-up scene. This is where we have found the Copenhagen FinTech ecosystem the weakest and least developed and where growth potential especially seems to lie. However, we have also identified some important recommendations to strengthen the position of the established players in the ecosystem. It should be noted that it is especially, the collaboration and the dynamics between the stakeholders in the ecosystem that are crucial for developing a strong Danish FinTech scene, create more innovation and attract investments and talented people.

Taken cost, ease of implementation and impact into consideration we have selected a series of actions to focus at in 2016: four concrete actions related to leverage the established FinTech sector and nine concrete actions related to develop the FinTech startup ecosystem.

Prioritisations related to enhancing the established FinTech sector

The established players within the Danish FinTech scene have potential to unleash a lot of value if furthering their foundation for innovation. However, if the established players do not take further action, revenue and jobs are at risk being taken over by disruptors – of which many are likely to be from outside Denmark⁴.

It is recommended that the established FinTech sector focus on the four following actions:

- **Upskill existing employees and attract new talent** who jointly can help innovate and fulfil the roles of a future where IT and digital solutions will be more integrated within the financial services industry.
- **Invest more in developing internal innovation** to leverage existing resources.
- **Engage in open innovation and help build the start-up FinTech ecosystem**, since it is within the intersection of start-ups and established players that a lot of innovation and not least growth can happen.
- **Establish structured collaboration between universities and science institutes** to further applied science and research.

Prioritisations related to building a start-up ecosystem - Launch Project CPH FinTech

To strengthen the entire ecosystem it is critical to foster a more conducive environment for the FinTech start-up scene. In order to do this it is recommended to prioritise nine concrete actions in 2016 to make Copenhagen a hub for FinTech start-ups - we call it “Project CPH FinTech Hub”:

- **Establish a FinTech co-working space in the centre of Copenhagen** to ensure a centre of gravity where FinTech start-ups, investors, established players and other stakeholders in the ecosystem can meet.
- **Run multiple early stage activities** like hackathons, meet ups, etc. to facilitate people and stakeholders in the ecosystem in getting together, sharing ideas and information and finding ways to collaborate.
- **Launch an accelerator or another support program** for growth start-ups to attract and connect foreign start-ups, investors and established players.
- **Establish a pool of high quality mentors** including successful entrepreneurs, subject experts and industry professionals to support new start-ups with their experience and network.
- **Work closely with established players** to increase their engagement in the FinTech community in order to leverage their resources and enhance collaboration and open innovation

⁴ Børsen, Danske Bank-chef: 25 mia. risikerer at gå tabt, 27.11.2015

- **Connect investors and start-ups** and encourage more investors to focus on FinTech to establish a more conducive environment for FinTech start-ups and scale-ups.
- **Lobby the Government and Municipality of Copenhagen** to support the FinTech agenda, including improving visa rules and making it more attractive to be tech investors.
- **Encourage the regulator to work closer with innovators** to support them in navigating within the existing regulation and adjust policy setting for regulation obstructing innovation.
- **Conduct communication and marketing** to coordinate and engage the ecosystem as well as promote Copenhagen as a FinTech hub at a national and international level.

Collaborating across the sector and building on top of existing projects

It is recommended that the entire sector come together to collaborate and help finance and implement the recommendations. Copenhagen has a relatively small FinTech scene and to compete with other cities, there is a need to join forces and ensure that new initiatives build on top of existing initiatives.

Establish implementation team for Project CPH FinTech Hub

A project like Project CPH FinTech Hub will require a full time team to set up and run the recommended activities. This will include a MD or similar senior person with experience in building ecosystems and a team to cover event management, community building, designing, delivering training and support programs, marketing and communication plus other various activities.

Funding and estimated costs of Project CPH FinTech Hub

Funding should be secured to run Project CPH FinTech hub for at least the next 3 years. This is essential to ensure the project does not become a one off activity but gets the commitment and time to develop and establish Copenhagen as a FinTech hub. It is estimated that the total costs of implementing a critical mass of activities in Copenhagen as per “Project CPH FinTech Hub” will be approximately €800k-1.2m p.a. depending on the exact ambition level. If the support program shall include an accelerator of international top quality, the total costs will amount to €2m p.a.

Impact of Project CPH FinTech Hub

Project CPH FinTech Hub will have a significant impact of job creation, innovation, export and positioning of Copenhagen internationally. The total job creation potential of Project CPH FinTech Hub is estimated to 1,000-1,450 new jobs in startups alone. This corresponds to trebling the number of people employed within FinTech startups today. It should be noted that this is based on average numbers and not taking into account the impact if and when some companies really take off and create hundreds of jobs.

2. Introduction: Tapping into a high growth sector

FinTech - digital financial technologies is currently reshaping the development and future of the financial services sector by disrupting financial services and products, much in the way that similar digital technologies have reshaped other industries like publishing, music, tourism and taxis in recent years. **FinTech is seeing exponential growth, and the level of global FinTech investments in start-ups have more than tripled in the last five years** from DKK 5.6bn in 2008 to DKK 17.8bn in 2013⁵. Interestingly, the investments in innovation appears to be occurring in a relatively geographically decentralised manner, where hotspots such as New York, Silicon Valley, London, Tel Aviv and Singapore seem to attract the largest share of investments. Albeit at a different scale, other European cities such as Stockholm, Zurich and Amsterdam have also built up growing FinTech scenes attracting global attention and new investments.

Moreover, new innovative **FinTech solutions are also widely impacting productivity, efficiency and innovation in other sectors and parts of society**. Digital payments and transfers save consumers, businesses and public bodies time and for the expensive handling of cash, peer to peer lending opens up new funding opportunities for SME's and Start-ups, access to large amounts of data helps business become more efficient and develop new services and business models, and new apps make it easier for both businesses and private consumers to keep a sound economy by keeping track of incomes, expenses, savings, coming payments, etc.

In a global or even European context, Copenhagen is not positioned as a FinTech hub today, but as this analysis shows, **the emergence of FinTech represents a great growth opportunity and potential for Copenhagen and Denmark**. The basic building blocks for becoming a leading Nordic FinTech hub are already in place, and Copenhagen has recently been ranked number five in the European Digital City Index 2015⁶ looking into the strengths and weaknesses of the local startup ecosystem. Due to a well-developed digital infrastructure, a high level of e-readiness and a good access to a highly skilled and, compared to other digital hotspots – a relatively inexpensive workforce, Copenhagen is an easy and attractive place to do business. Additionally, Copenhagen is generally perceived to be a highly liveable city, and the culture for collaboration between businesses and public authorities is highlighted as a unique Danish feature that opens up for creating new and durable digital solutions. Last but not least, the analysis points out that Denmark has traditionally had a high level of innovation within the financial services sector with close links to the established suppliers of IT and technology and a high level of tech readiness.

However, the path to becoming a leading Nordic FinTech hub is not clear-cut, as **Copenhagen faces a number of challenges and barriers that needs to be addressed**. In recent years, the number of new disruptive Danish FinTech start-ups has increased and today the FinTech start-ups employ around 550 people. However, overall Copenhagen is still considered having a rather small and scattered FinTech eco-system where the different players (startups, investors, established players and public institutions) do not work closely together. Very few established players are active in the eco-system and few are driving significant internal innovation programs. In addition FinTech startups lack a closer relationship to the regulatory bodies and a stronger commitment from politicians to drive the FinTech agenda. Finally, then FinTech startups (just like startups in other industries) suffer from the relatively lack of access to risk capital in Denmark, which makes most growth startups look towards London and other places for capital and growth.

The purpose of the present study is first of all to map and analyse the Danish FinTech environment and benchmark Copenhagen to other international FinTech hubs. Based on this, we develop a number of recommendations that should

⁵ Accenture: The Boom in Global Fintech Investment – A growth opportunity for London (2014)

⁶ <https://digitalcityindex.eu/>

be initiated in order to strengthen the Danish FinTech ecosystem and enable Copenhagen to compete and thrive on FinTech at a regional and global level.

The project is initiated by the City of Copenhagen, the Financial Services Union Denmark (Finansforbundet), the Danish Bankers Association (Finansrådet), Nets, Saxo Bank, the Association of Danish Lawyers and Economists (DJØF), BEC, TRYG and CFIR. Oxford Research and VentureScout have been commissioned to carry out the analysis.

Approach undertaken

In order to create the best viable conditions for growth in FinTech and enable Copenhagen to compete at a regional and global level, this study focuses on enhancing the ecosystem meaning the whole network of actors that make up the FinTech sector. It is built on the notion that the start-ups, the established financial services institutions, the IT and tech suppliers, the venture capitalists and business angels, the research and educational institutions as well as the governmental authorities are interconnected and affect each other, creating a constantly evolving relationship. Based on international literature on building startup ecosystems as well as our international case-studies of successful FinTech hubs around the world, we have identified 6 key factors for becoming a Fintech hub:

1. **A vibrant FinTech startup community:** At the grass root level, there needs to be a lot of events and activities going on, which can help the establishment and growth of start-ups.
2. **Active established players:** It is crucial that large established FinTech players invest in innovation and in leveraging the FinTech potential - start-ups cannot build a world class FinTech hub alone.
3. **Access to risk capital:** The access to risk capital is critical to fund the establishment and growth of innovative companies.
4. **Political support and ‘friendly’ regulator:** Central public bodies need to support the FinTech sector and announce their support publicly, and regulators need to change from a reactive to a more proactive and collaborative mindset.
5. **Access to talent:** FinTech is a knowledge intensive sector highly dependent on access to high skilled specialised labour
6. **Brand as a FinTech hub:** To attract international talent, investors, businesses, etc. need to build a brand as an important FinTech hub.

Throughout this report we have used 6 key success factors to both evaluate the strengths and weaknesses of Copenhagen as a FinTech Hub; in our comparison and benchmarking with 8 other cities; and as categories for our recommendations.

Methodologically, the analysis is based on the following:

- **Desk research and literature review** of existing international articles and reports
- **27 qualitative interviews.** 9 interviews with national FinTech experts and stakeholders. 18 interviews with international FinTech experts and stakeholders.
- **Six workshops** with the stakeholders of the ecosystem – start-ups, investors, research and educational institutions, corporates, regulators and public authorities, accelerators and co-working spaces.
- **Two web based surveys.** One with Danish Fintech companies and one with international experts and stakeholders.
- **Eight case studies** on international FinTech hubs describing their ecosystems and strengths and weaknesses in relation to FinTech.

The use of different methodological approaches, both qualitative and quantitative, makes it possible to triangulate and thereby strengthen the validity of the findings⁷. In this analysis, we have combined desk research, literature review, qualitative approaches (interviews and workshops) with a quantitative survey among FinTech companies in Denmark and international experts and stakeholders to ensure a cross verification of the findings from more sources. For a more detailed account of our methodology, please see chapter 8.

⁷ Greene, Jennifer C. (2007): Mixed Methods in Social Inquiry

3. What is FinTech?

FinTech has become an increasingly ‘hot’ topic in the financial sector and among organisations and politicians working with business and regional development. Basically, FinTech is a contraction of *financial technology*, but in the literature there is still not a consensus on the exact definition and delimitation of FinTech. Clearly, many recent studies have demonstrated the difficulties in using traditional mapping and research tools when studying the FinTech sector such as traditional employment and sector statistics. This is mainly due to the transversal nature of digital technologies in the financial services sector as well as in most other sectors today and the fact that almost all parts of the financial sector already today is heavily digitalised.

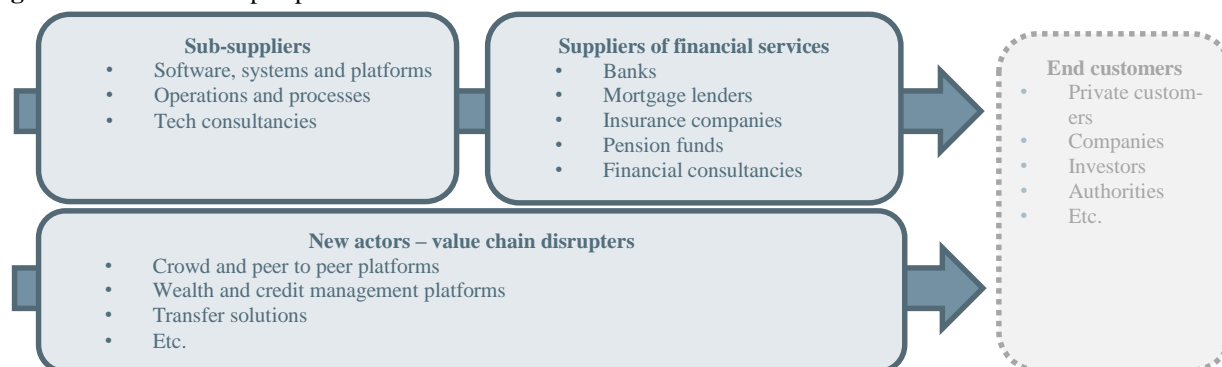
In this study, FinTech is defined as ‘*digital technologies and solutions that supports and enables financial services and activities*’. Our definition is not limited to ‘*those that develop and offer technologies*’ for the financial sector. In our view, FinTech should also include the buyers and applicants of technology in the financial service sector – the banks, insurance agencies, pensions funds, mortgage lenders etc. In practice, the financial service providers are both important drivers of FinTech innovation and are also often deeply involved in the development and implementation of FinTech solutions.

Secondly, our definition emphasizes that FinTech is about digital technologies. We acknowledge that technologies such as money printing and hardware for payment solutions and cash withdrawal are not solely digital but also contains physical parts. However, we think it is important to stress that it is the digital technologies that this project has in focus. It is the digital technologies, which are changing the financial sector rapidly today and it is within the digital solutions and technologies that the growth potentials are.

Finally, we will stress that digital technologies that are not exclusively used in the financial sector, but which are crucial enablers in offering financial services, such as for example cybersecurity solutions, are also to be considered FinTech.

Figure 3.1. shows, how we view FinTech from a value chain perspective. As described we suggest that the term FinTech includes both traditional value chain sub-suppliers of FinTech, the traditional suppliers of financial services and the many new FinTech start-ups that are disrupting the existing value chain.

Figure 3.1. Value chain perspective of FinTech



Next to the value chain perspective it is also interesting to analyse and understand FinTech from a market segment perspective. Though many FinTech trends are transversal and influence most FinTech market segments, the different market segments within FinTech technologies do have some different dynamics, growth potentials and different types of actors. Some market segments such as internal infrastructure & processes are consolidated and almost completely dominated by established players, while others such as payments and transfers and equity and lending have experienced a boom in new disruptive start-ups. Recent international studies of FinTech and FinTech-investments as well as previous studies of the Danish FinTech sector⁸ suggest that some of the most important FinTech market segments are:

- Payments, remittances & transfers
- Retail banking & investments
- Personal finance
- Equity & lending
- Institutional investments, portfolio and risk management
- Internal digital infrastructure and processes
- Cyber security
- Crypto currencies
- Financial research and data

In this study, we will use these FinTech market segments to analyse and categorise the Danish FinTech sector to get a more precise idea of the strengths and competencies of Danish FinTech.

⁸ EY (2014): Landscaping UK Fintech
 Accenture (2014): The Future of Banking and Fintech
 AWI, KPMG and FSC (2014): The 50 Best Fintech-Innovators Report
 Silicon Valley Bank (2015): Investment Trends in Fintech
 Oxford Research (2012): Global arbejdsdeling i den finansielle sektor
 Oxford Research (2009): København på det finansielle verdenskort

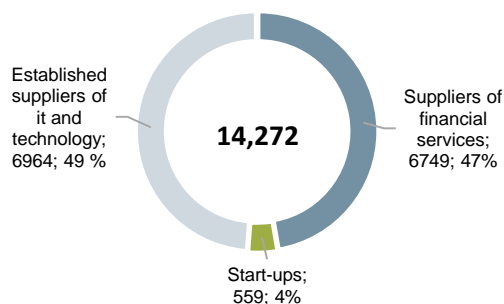
4. The Danish FinTech scene – home to more than 14,000 employees

The Danish finance and IT sector both play important roles for the Danish economy and employ an important share of people in the Danish workforce. In 2015, 78,759 people were employed in the financial sector, while 53,461 people were employed in the IT sector in 2014⁹. Thus, the people employed in the finance and IT sectors together constitute 132,220 people and thereby approximately 5% of the total Danish workforce.

Looking specifically into the Danish FinTech sector, it employs around 14,000 people¹⁰, which makes up approximately 11% of the total workforce within the finance and IT sector. To give a comparative idea of the sector's size, this is almost three times as many employees as in the Danish design industry, twice as many as in architecture and one-third more employees than in the energy sector¹¹.

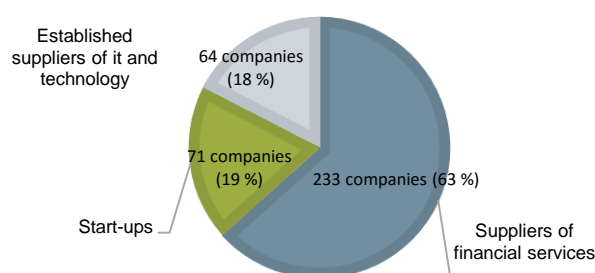
The Danish FinTech sector is made up of 368 companies, where the vast majority are suppliers of financial services such as banks, insurance companies, pension funds, mortgage lenders (63%). 71 companies are start-ups (19%), and 64 companies (17%) are established suppliers of IT and technology. Looking into the geographical location of the FinTech companies, it is clear that the capital area of Copenhagen makes out the natural epi-centre and driver of the Danish FinTech industry housing 2/3 of all Danish FinTech companies. The City of Copenhagen houses 38% of all FinTech companies.

Figure 4.1. FinTech employees by type of business



Source: Oxford Research and RainmakingInnovation

Figure 4.2. FinTech companies by type of business



Source: Oxford Research and RainmakingInnovation

Summing up, the Danish FinTech sector is dominated by established players and with a modest start-up scene compared to other FinTech hubs, such as for example Stockholm, where FinTech start-ups and young companies today employ several thousand persons¹².

⁹ Statistics Denmark, www.statistikbanken.dk

¹⁰ Based on calculations of Oxford Research and RainmakingInnovation. For a methodological description, please see chapter 8

¹¹ Regstat (Erhvervsstyrelsen) 2015 and Kreative Erhverv og Design, Region Syddanmark 2014

¹² Stockholm Fintech, Stockholm School of Economics, 2015

The established suppliers of IT and technology include the Danish data centres (BEC, SDC, Bankdata and FDC) that are owned jointly by the financial service sector as well as large international IT and tech suppliers such as Nets, IBM, Microsoft, SimCorp, Logica, Accenture and CSC. The large international companies have traditionally had a relatively strong presence in Denmark and play a vital role for the Danish financial industry both by running daily IT operations and by supplying new IT and tech solutions.

The suppliers of financial services employ around the same number of people as the suppliers of IT and technology, which is the effect of the sector's high commitment to the use of IT and digital solutions. Most of the suppliers of financial services are micro and small enterprises (0-49 employees) and include small banks and insurance companies, asset management companies and other financial advisors (149 companies). In these companies, the share of FinTech employees is generally low, as it is mostly the larger financial services suppliers such as Nordea, Danske Bank, TRYG, Saxo Bank and PensionDanmark that contribute to the FinTech employment.

The start-ups make up 19% of the companies but only 4% of the employees. Of these start-ups, nearly 70% have been established in last 5 years, showing that the start-up scene within FinTech is growing and fairly new in Denmark¹³. The Capital Region of Denmark houses approximately 79% of the start-ups, while the City of Copenhagen houses more than half of the start-ups (56%). Some of the most notable and mentioned start-ups include Lendino, Coinify, MeeWallet and Tradeshift. These companies are placed in different market segments and are challenging the established financial services sector in different ways.

4.1 DANISH FINTECH HOLDS SIGNIFICANT FUTURE EMPLOYMENT PROSPECTS

The existing Danish FinTech companies expect an increase of FinTech employees within the next five years of more than 5,000 persons altogether¹⁴. Clearly, a large part of these jobs would naturally stem from organic growth and take away jobs in other parts of the FinTech sector. However, looking at the growth rates in FinTech jobs in cities such as Stockholm and Tel Aviv and not the least London and New York that have succeeded in becoming FinTech hubs, **there remains no doubt that FinTech holds large growth potentials for Copenhagen and Denmark.** FinTech employment grew by 44% in Stockholm from 2010 to 2013 and investments in FinTech start-ups has totalled 532 million USD the past five years¹⁵.

However, as will be explained, the study also shows that a joined and focused effort is needed in order to actually leverage this potential. At the same time, the growth in new financial technologies does not only contain a large growth potential. **The often disruptive nature of FinTech also makes it a burning platform for Copenhagen,** where many FinTech professionals today are employed by traditional established financial service and IT suppliers. Thus, by not doing anything or just keep on 'doing the same as always' Copenhagen and Denmark will risk losing many FinTech jobs to the cities and hubs where new innovative FinTech solutions flourish.

¹³ Based on Experian's company database, 49 FinTech start-ups were established between 2011-2015

¹⁴ According to the survey, the Danish companies expect a general increase in employment of 36% in five years.

¹⁵ Stockholm – Europe's No.2 FinTech city, June 2015

4.2 STRONGHOLDS AND SPECIALISATION OF THE DANISH FINTECH COMPANIES

The companies of the Danish FinTech sector are specialized in different market segments indicating that the Danish FinTech scene covers a broad range of solutions and products. Generally, the sector comprises on the hand an established part consisting of the IT and technology suppliers and the financial services providers and the other hand, the newcomers represented by the start-ups.

4.2.1 The suppliers of financial services

The financial institutions are specialised in different market segments, but many of them are within the banking sector that to varying degrees cover a broad range of market segments including payments, equity and lending and retail banking. Generally, the market segments of the financial industry are categorised by their target clients (e.g. retail, corporate, and institutional) and service types (e.g. investment banking, retail banking, wealth management)¹⁶. As we do not have sufficient responses in the survey for this type of business, we are not able to map the companies' specific categorisation in these market segments.

While the financial services sector is being challenged by the start-ups, it is generally our assessment that the financial industry still holds a number of competitive advantages such as specific financial expertise (risk assessment, evaluation and management), discretion in handling client-specific (digital) data, as well as many years of experience of providing clients with a high standard of regulation-induced operational security¹⁷.

4.2.2 The established suppliers of IT and technology

The established suppliers of IT and technology are typically running the daily IT operations and supplying new IT and tech solutions to the financial service providers, thus they are highly specialized in the market segment 'internal digital infrastructure and processes'.

As described, there is a strong presence of digital companies in Denmark, and global IT companies such as Microsoft and IBM have established their R&D departments in Denmark. IT has traditionally played a large role in the Danish financial services sector, and by the late 1990s, the financial sector was a truly digitalised industry. IT's reach into the sector is still increasing, and the established suppliers of IT and technology still play a significant role in the digitalization of the sector.

4.2.3 The FinTech start-ups

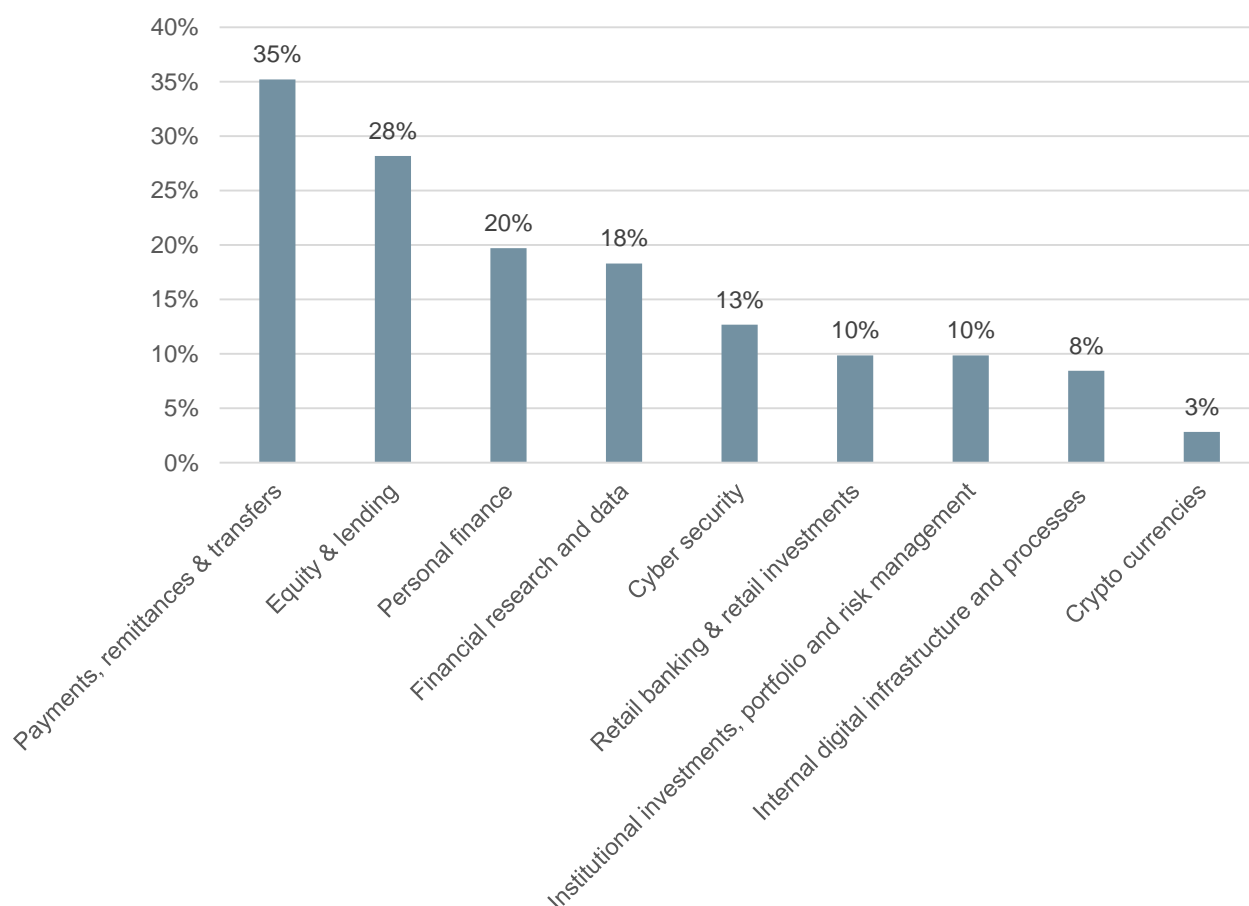
The Danish FinTech start-ups are spread across the different market segments indicating that the Danish FinTech start-ups are not highly specialized in one area, but they cover a broad range of FinTech related solutions and products.

¹⁶ Venzin, Markus (2009): Building an International Financial Services Firm: How Successful Firms Design and Execute Cross-Border Strategies in an Uneven World

¹⁷ Deutsche Bank Research (2014): Fintech – The digital (r)evolution in the financial sector

As seen from figure 4.3., ‘Payments, remittances and transfers’ seems to be the strongest business area of the FinTech start-up scene, as 1/3 of them (35%) operate within this business area. An example of a start-up in this business area is MeeWallet that is specialized in payments by offering a digital wallet solution where all payment and loyalty cards can be integrated and used in the same way as in a physical wallet.

Figure 4.3. Distribution of start-ups on business areas



Source: Oxford Research and RainmakingInnovation, N = 71

Another large market segment is ‘Equity and lending’, where 28% of the start-ups are operating. One of the most well-known companies within this area is Lendino that provides a market place for loans, where private and professional investors can loan directly to creditworthy firms. ‘Equity and lending’ also includes start-ups working with crowdfunding, which constitute one-fifth of the start-ups in this market segment. Crowdfunding can be translated to ‘raising monetary contributions through a network’ and is a growing industry within FinTech. An example of a company that works with crowdfunding is Boomerang.

Within ‘Personal finance’ (20%) there is also a large share of start-ups, as there is a market for helping customers with handling and optimizing their personal funds. Monera is an example of a start-up that offers private clients an individual guidance to manage their personal finances and supports them in concluding attractive agreements with financial institutions.

Lastly, 18% of the start-ups focus on ‘Financial research and data’, as it is a growth area, where many digital start-ups see a potential. Mostly, it is not their primary core service, but due to the many possibilities attached to utilizing data, many of the start-ups focus on this as part of their business model to optimize their services. For instance, Sproom is offering electronic invoicing for all businesses by providing an open business network, where data can be transacted securely across the network.

In the remaining market segments, the share of start-ups is lower. These include ‘Cyber security’ (13%), ‘Retail banking and retail investments’ (10%), ‘Institutional investments, portfolio and risk management’ (10%), ‘Internal digital infrastructure and processes’ (8%) and ‘Crypto currencies’ (3%). However, it is important to be aware that although the number of start-ups in these segments is rather low, there are some interesting players here as well, and as no one knows what the future holds, a large exit could potentially happen in one of these business areas. Within ‘cyber security’, Codesealer is an example of start-up that has received funding by Seed Capital and Vækstfonden and provides companies with a solution to minimize their potential cyber security risks. In ‘Retail banking & retail investments’, Trifork is an example of a start-up with a strong position in supplying custom-built applications and end-to-end solutions, employing 140 people. Trifork also has a high degree of international activities with 7 offices across Europe, including offices in leading FinTech hubs such as London, Stockholm and Amsterdam.

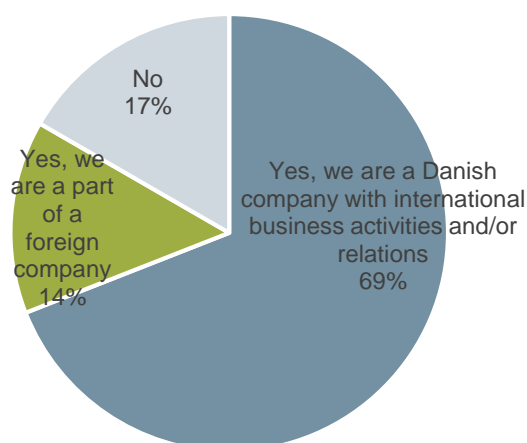
The business area ‘Internal infrastructure & processes’ is rather weak in the start-up scene, as this is a service that is consolidated in the established part of the FinTech sector. The established sub-suppliers have traditionally handled the IT operations and systems of the financial services sector. The last market segment is ‘Crypto currencies’, where few start-ups have business activities. Although the share of the market segment is low, it is a relatively new business area where many new crypto currencies have emerged in recent years – most notably the Bitcoin. In Denmark, the best known company in this area is Coinify that works to spread the use of digital currencies.

4.3 INTERNATIONALISATION AND THE GLOBAL MARKET

The Danish FinTech companies are generally international and globally oriented. As the survey shows, 83% are companies with international activities. More than two-third (69 %) of the companies are Danish companies with international activities and/or relations, while 14% are not originally Danish, but a part of a foreign company.

According to the survey, all of the established suppliers of IT and technology are international companies and have business activities and/or relations abroad, examples include large Danish corporates such as Nets and SimCorp. 76% of the start-ups are international, which clearly demonstrates that these companies are born global from the beginning. As digital companies, they operate and thrive in a global setting by providing solutions that can immediately be expanded to other countries. The case for the suppliers of financial services is different, as these often operate in a domestic market. It is mostly the larger financial companies that have international activities, while the smaller banks and insurance companies are highly specialized and dedicated to the Danish market.

Figure 4.4. Does your company have international business activities or relations?



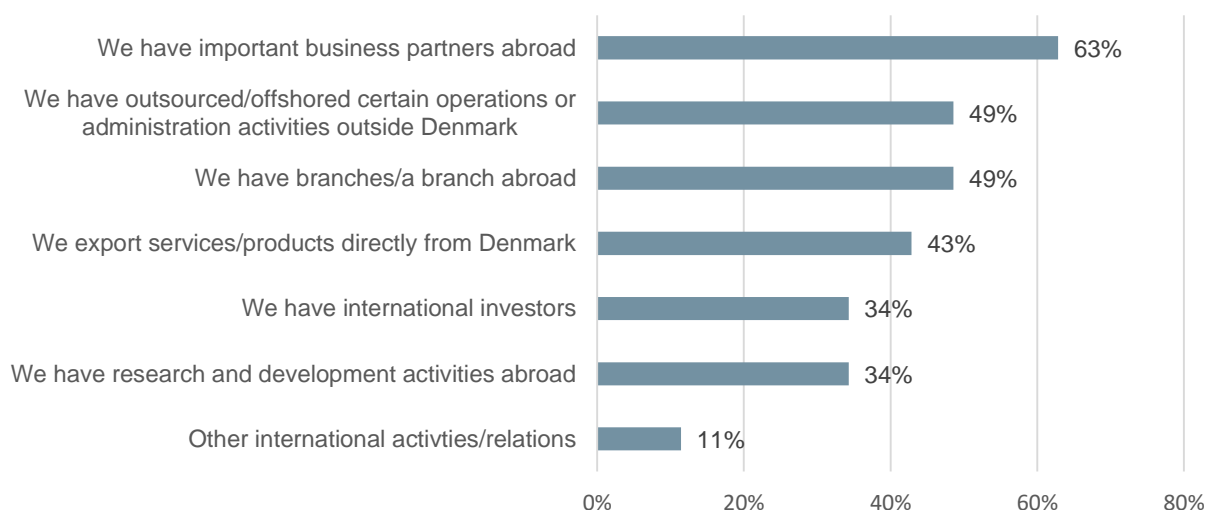
Source: Oxford Research and RainmakingInnovation, N = 42

of FinTech companies have a global mind-set and approach in their business model, but also that international partners see a great potential in the Danish FinTech companies.

As visualized in figure 4.5., the main types of international activities among the Danish FinTech companies are 'important business partners abroad' (63 %), 'outsourcing/offshoring of certain operations or administrative activities' (49 %) and 'having branches abroad' (49 %).

The high degree of cooperation with important business partners abroad shows that a large proportion

Figure 4.5. Type of international business activities/relations



Source: Oxford Research and RainmakingInnovation, N = 35

Nearly half of the companies (49 %) state that they have outsourced/offshored certain operations or administration activities outside Denmark. As the literature in this area shows, the primary factor for outsourcing and offshoring is to lower costs, and within the IT and financial services sector it is a widespread practice to establish new international branches abroad or to enter into cooperation with foreign sub-suppliers. As the workforce in Eastern European countries or India is considerably cheaper than in Western Europe, it is a motivation for internationalization. At the same time, the workforce in these countries are highly skilled IT professionals that can take part in the companies' IT operations.

The figure also shows that 1/3 (34 %) of the international companies have international investors. It indicates that there is an interest in countries outside Denmark to invest in the Danish FinTech sector. The internationalization is moreover consolidated in the proportion of companies who have branches abroad (49 %) and those who export their services/products from Denmark (43 %). The latter shows that there is a demand for Danish FinTech solutions in other markets. Later in this analysis, we will show the characteristics of the Danish export and to which markets that the Danish FinTech companies primarily export.

Looking at the reasons for why companies choose to have activities outside of Denmark, the three most important are:

	1 st priority	2 nd priority	Total
Access to a new market	48%	11%	59%
Access to a skilled workforce	10%	32%	41%
Lowering of costs	24%	11%	34%

Source: Oxford Research and RainmakingInnovation, N = 29

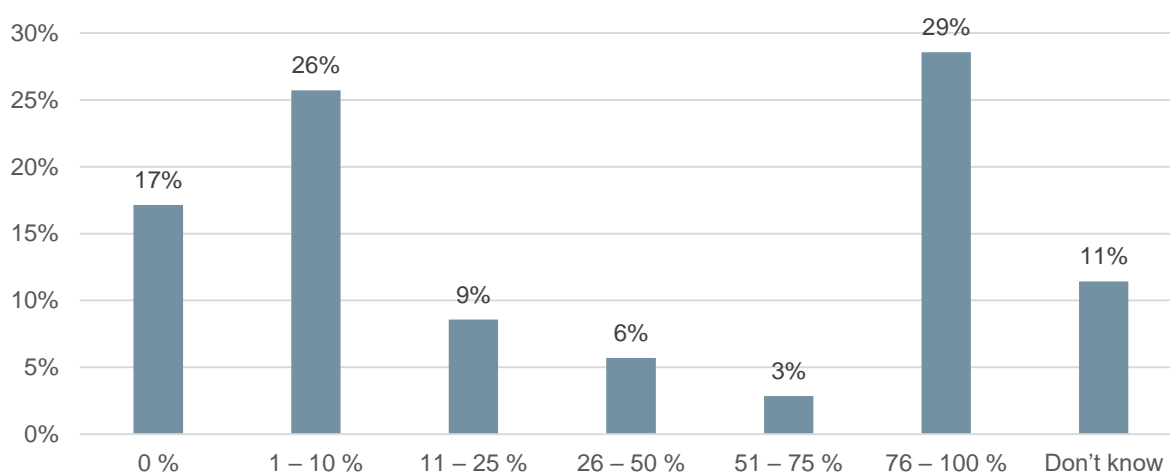
Most companies have 'Access to a new market' and 'Lowering of costs' as a first priority, while many have 'Access to skilled workforce' as a second priority to why they have activities outside of Denmark. Firstly, considering the relatively small size of the Danish market, it is not surprising that many companies choose to expand their business activities abroad. This is also evident in the types of international business activities/relations shown in figure 4.5, where 2/3 of the Danish FinTech companies are internationalized by having business partners abroad. Secondly, the business activities related to the lowering of costs indicates, to some extent, that the Danish FinTech sector faces challenges in terms of production and labour costs. Thirdly, the activities related to accessing skilled labour outside Denmark shows that the Danish companies face challenges in finding and accessing skilled IT professionals in Denmark.

4.3.1 Export of FinTech related products and services

The share of FinTech related products and services that are exported seem to be placed in two camps. 43 % of companies export 0-10 %, while 29 % of the companies export 76-100% of their products and services. Few companies state that their export rate falls in between these two blocks. When comparing export on the different types of companies, FinTech start-ups are well-represented in the group of companies that export 76-100 % of their products and services, although many start-ups also export significantly less. The high degree of export indicate that start-ups think globally in their business model from the beginning. Suppliers of financial services and established suppliers of IT

and technology generally report a lower share of export. This is partly due to their services and products being more oriented towards the Danish market, and partly due to fact that their internationalization is characterized more by outsourcing of activities.

Figure 4.6. Export share of FinTech related products/services



Source: Oxford Research and RainmakingInnovation, N = 35

Looking closer at the markets, where the FinTech companies operate in, it is clear that the close markets are the most important for the FinTech companies. The majority of companies prioritize Denmark as their most important market, followed by the Nordic and EU countries as the second and third most important markets¹⁸. Accordance between Danish and EU legislation makes it easier for companies to manoeuvre on the European market and thereby increases the export opportunities. The identical transnational regulation also has the potential to attract more foreign investment to the FinTech sector from other EU countries. A relatively low proportion of the companies state their most important markets are placed outside the EU. This can be explained by a smaller know-how about market conditions, adjustment of the products and services to the market standards, and compliance with regulations/legislation.

¹⁸ According to the survey, 22 list Denmark as their most FinTech market, 20 companies have the Nordic countries as their second most important market, and 13 companies have the EU countries as their third most important market.

5. The FinTech ecosystem

Established companies, start-ups, public authorities, angel investors, venture capitalists and academia are all essential in forming a strong and vibrant FinTech ecosystem. The collaboration and the dynamics between them are crucial for developing a strong Danish FinTech scene, create more innovation, foster new start-ups and attract investments and talented people.

By looking into the multitude of data sources such as the survey, the interviews and workshops, we have assessed the strength and weaknesses of the Danish Fintech ecosystem. Looking at the 6 key factors for becoming a FinTech hub, the study points at the following strengths and weaknesses of the Danish Fintech ecosystem. After the summarizing table 5.1., the strengths and weaknesses are described in more detail.

Table 5.1. Strengths and weaknesses of the Danish FinTech Ecosystem		
The 6 key factors for becoming a FinTech hub	Strengths of the Danish FinTech ecosystem	Weaknesses of the Danish FinTech ecosystem
A vibrant FinTech start-up community	<ul style="list-style-type: none"> Denmark in general hosts a vibrant and growing digital start-up scene (though not specialised in FinTech). 	<ul style="list-style-type: none"> Few FinTech start-ups So far, no joint initiatives or physical meeting places gathering the FinTech start-up community No accelerator program for FinTech start-ups
Active established players	<ul style="list-style-type: none"> Tradition of cooperation between established players, e.g. through Nets, BEC, FDC Danish financial service sector has traditionally been seen as innovative and as forerunners in adapting new digital technologies Existing cluster and network organisation for finance and IT players (CFIR) 	<ul style="list-style-type: none"> Established players are generally not very active in driving open innovation and investing in the ecosystem Further, only a few established players are running substantial internal innovation programs
Access to risk capital		<ul style="list-style-type: none"> No or few dedicated FinTech investors Lacking tax incentives for business angels compared to for example the UK
Political support and 'friendly' regulator	<ul style="list-style-type: none"> A strong political agenda from central government on digital infrastructure and digitalisation. As a result Denmark has a strong digital infrastructure and the high level of e-readiness At the overall level, Denmark is ranked as one of the easiest countries in the world to do business in 	<ul style="list-style-type: none"> No dedicated political support for FinTech The Danish FSA appear to be more reactive and administrative in their approach - where regulators in some of the leading FinTech hubs are proactive and dialogue-minded
Access to talent	<ul style="list-style-type: none"> Strong competencies in user-centred digital design Relatively low costs of skilled labour compared to other FinTech hubs such as London, New York and Silicon Valley 	<ul style="list-style-type: none"> Lack of people with specialised FinTech skills understanding both the digital domain and the financial sector Limited research in FinTech and little knowledge transfer from research institutions to companies
Brand as a FinTech hub	<ul style="list-style-type: none"> The Money20/20 conference is coming to Copenhagen in 2016 and can help position Copenhagen internationally 	<ul style="list-style-type: none"> So far, Copenhagen is not known for being a FinTech hub and there has been no joint effort in branding the city as a Nordic FinTech hub

5.1 DESCRIPTION OF THE KEY STRENGTHS – THE FOUNDATION:

- **A vibrant and growing digital start-up scene.** Denmark and especially Copenhagen has successfully fostered some large exits and international companies with significant growth such as Skype, Just Eat, Vivino, ZenDesk, Endomondo, TradeShift and TrustPilot, which can act as inspiration for aspiring FinTech start-ups. Further, few established players have significant internal innovation projects.
- **The Danish tradition of cooperativeness between the financial services sector and the public sector.** The highly developed digital infrastructure in Denmark is a product of the close ties between the public authorities and the financial services sector. This collaboration is institutionalised in the IT project council that is composed of leaders from the public and financial services sector with the aim of professionalising the work on IT projects of the Danish state. As the analysis shows, the well-operated partnerships between the public sector and private sector can be an enabler for developing new common and forward-looking digital solutions.

“In Denmark, we have a long tradition for collaboration between the private and public sector. Because of this, I think that we have a solid foundation for creating a strong ecosystem”

Henrik Koch, Industry Leader of the Financial Services Sector, IBM

The Danish financial services sector is highly committed to the use of IT and digital solutions and is accustomed to running large-scale digital projects. As an example, Denmark was the first country in the world to digitalise stocks and bonds. Also, the financial services sector as well as established IT suppliers traditionally have had close links and have cooperated on joint IT solutions among others, through the Danish datacentres and Nets.

- **Existing cluster organisation for the intersection of finance and IT that can act as a platform for further action.** CFIR (Copenhagen FinTech Innovation & Research) is a non-profit member based organisation established in 2009. CFIR is open to companies and organisations with interests within the finance IT area. CFIR develops research, innovation and education within financial technology. While CFIR is a central player for the collective Danish effort in FinTech, there is also a number of other progressive Danish organisations within FinTech such as the Danish Bankers Association (Finansrådet), the Financial Services Union Denmark (Finansforbundet), the Association of Local Banks, Savings Banks and Cooperative Banks in Denmark, the Danish Crowdfunding Association etc.
- **Strong digital infrastructure and the high level of e-readiness in Denmark** provides innovators with a unique access to develop new digital solutions. Public authorities are forerunners in digitalizing communication and transactions with both citizens and businesses. Today, most Danes have a digital mailbox through which they receive information and Denmark has recently been crowned Europe’s most digital nation¹⁹. Nearly all Danes have internet access, and 96 % of the Danish population have used the internet within the last three months²⁰. One reason for this is Denmark’s ambitious e-government strategy and the personal digital infrastructure system NemID, where citizens can handle everything from internet banking, changing tax registration and booking doctor’s appointments online. Even though it is mostly a strength, the well-developed infrastructure could also act as a barrier for new start-ups that have to adapt to the standardised digital solutions.

“The high level of digitalisation is clearly a valuable asset for Denmark. It contributes to create a digital mind-set, which gives a comparative advantage to countries that don’t have a digital infrastructure to build on”

Gert Sylvest, Co-founder and CTO of Tradeshift

¹⁹ Digital Economy and Society Index, 2015

²⁰ Statistics Denmark, www.statistikbanken.dk

- **Easy to do business in Denmark.** According to the World Bank, Denmark is the best European country for business in 2015. A Danish company can be incorporated online with all corporate registrations in place within a few hours, and it is easy to interact with the public authorities as the level of bureaucracy is comparatively low.
- **Strong competencies in user-centred digital design.** There is a Danish tradition and culture for involving the users in the design process and reflecting on the users' needs and preferences in the final product or solution. The students at the Danish IT University can specialise in user-centred digital design, and there are already good examples of functional and user-friendly FinTech solutions such as Saxo Bank's trading platforms and Danske Bank's MobilePay. Next to this, the cost of high skilled labour with financial and ICT skills in general, are lower in Denmark and Copenhagen compared to other FinTech hubs such as London, New York and Silicon Valley.
- **The Money20/20 conference** has chosen Copenhagen as their conference location from 2016 and onwards. It is the world's largest payments & financial services conference reaching more than 10,000 attendees. Clearly, this can help position Copenhagen internationally.

5.2 DESCRIPTION OF THE KEY WEAKNESSES – THE CHALLENGES:

- **Lack of focus on FinTech and so far no joined effort to create a strong Danish FinTech hub.** While a number of other cities have already started to take action and put FinTech high on their agenda, there has so far been a lack of a concerted commitment to create a strong international FinTech hub in Denmark. Some promising initiatives have been launched such as CFIR, but there is still a need to gather all the primary FinTech stakeholders and build a strong ecosystem.
- **There is a growing number of FinTech start-ups, but it is still at a modest level.** At the same time, there is no centre of gravity and no physical hub for the FinTech start-ups, thus the scene is fragmented with a low level of events and gatherings.
- **Established players are not very active in driving external innovation.** Few of the established players are actively engaging in and investing in open innovation and the FinTech ecosystem. Further, few established players have significant internal innovation projects.
- **Limited access to risk capital.** The growth of FinTech start-ups is challenged by the relatively low availability of risk capital. It stems from a lack of dedicated FinTech investors in Denmark. In addition the tax regime means that it is not very attractive to be a tech investor in Denmark. The consequence is that most mature start-ups still need to look towards London or other places to receive growth capital.
- **Regulatory issues.** The financial sector is a highly regulated area and Denmark has to abide to the EU legislation to a large degree. However, today many start-ups perceive that the Danish regulator is more an administrator of the law than a proactive partner who is trying to help innovators to navigate within the regulation. Another issue is that the legislation is often adjusting too slowly to the new digital agenda of FinTech, which sometimes makes it difficult to leverage the new digital opportunities. Compared to for example London, then the regulator in Denmark is often viewed as being more an administrator of the law than a pro-active and collaborative partner for innovators

"We have a funding vacuum and a situation, where the investors are afraid to invest in the new innovators, because they are afraid of challenging the established financial players. At the same time we have some strong financial players that don't invest, because they want to protect their own businesses and minimise any potential risk".

Kim Vindberg-Larsen, Founder and CEO of MeeWallet

- **A lack of specialised digital financial skills.** The fundamental shift to new digital solutions and innovative products in the financial services sector create a need for a workforce that has an understanding of the digital trends and opportunities for financial services. As the analysis shows, these skills are currently not adequately covered by the Danish educational institutions.
- **Limited and scattered research in FinTech and low transfer of research based knowledge to the businesses.** There are limited resources put into FinTech in the dominant Danish research institutions. At the same time, bridging the latest research to the businesses is relatively weak, which is also the case for the practical collaboration between the companies and the universities. While not being a unique Danish challenge, but also a European challenge the lack of focus on research in finance and it is a weakness that limits potential growth and competitiveness of the Danish FinTech sector. Traditionally, research funds on a European level are allocated to other research fields such as health and energy.

Why Copenhagen makes out the natural hub for the Danish FinTech scene

Though FinTech companies can be found in most parts of Denmark, Copenhagen makes out a clear epicentre of the Danish FinTech ecosystem and also has some valuable ‘hub-assets’ in an international comparison.

- More than **60% of all FinTech companies are located in the Capital Region** and around 40% in the City of Copenhagen
- Both the city and the surrounding Capital Region has a **large concentration of headquarters** of financial services and IT suppliers as well as relevant universities, authorities and FinTech organisations
- The City of Copenhagen is already **the epicentre of the vibrant Danish digital start-up scene**
- Almost **60% of FinTech start-ups are located in the City of Copenhagen**
- More than **60% of both start-ups and established companies within FinTech find Copenhagen an attractive place for doing business**
- The city **ranks no. 5 in the European Digital City Index**
- It is a **highly human centred city** crowned several times as **the world’s most liveable city**
- Copenhagen offers a **relatively low cost of life and labour** compared to leading FinTech cities such as New York, Silicon Valley and London
- It is **Scandinavia’s most internationally connected city** in terms of international flights

5.3 THE COMPANIES’ ASSESSMENT OF THE FINTECH ECOSYSTEM

In order to evaluate the Danish FinTech ecosystem, we conducted a survey among the Danish FinTech companies, where we asked them to 1) assess the importance of a number of conditions for developing a strong FinTech sector and 2) to assess how well the Danish FinTech sector performs on these parameters. Figure 5.1. on the next page provides an overview of the respondents’ assessment, and what they regard as the strengths and weaknesses of the Danish FinTech ecosystem.

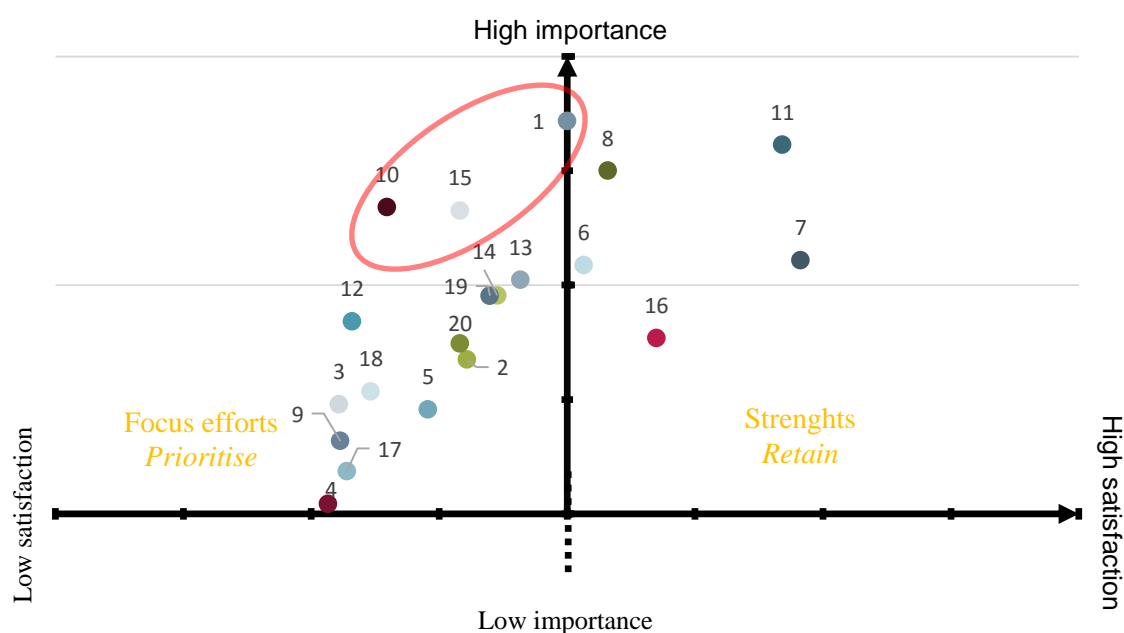
The conditions of the FinTech ecosystem can be divided into ‘strengths’ - high satisfaction and high importance and ‘focus efforts’ - low satisfaction and high importance. The respondents consider all the conditions to be of some importance, and none of the conditions are regarded as not important. The red circle in figure 5.2. illustrates that the respondents find the following parameters as the most important for creating a successful FinTech hub in Copenhagen:

- A friendly and progressive regulatory environment
- Access to funding (risk capital)
- Access to talent (a skilled workforce)

These three conditions are all assessed by the respondents to be focus efforts that should be highly prioritized, if Copenhagen wants to become a strong FinTech hub. Besides these highly prioritized areas, the responding companies assess that there are number of other conditions that should also be in focus for creating a vibrant FinTech ecosystem as seen in the quadrant ‘focus efforts’ in figure 5.2. It is clear that the companies generally assess that there is a great potential to improve Copenhagen’s ecosystem. However, on the bright side there are some conditions that they perceive to be strongholds of the Danish FinTech ecosystem:

- A well-developed digital infrastructure
- A high level of e-readiness in the population
- A strong financial services sector
- Access to customers
- Strong presence of established digital tech companies

These strengths are in accordance with the views expressed in the qualitative interviews with the national Danish experts and stakeholders. Also the literature and international indexes measuring and comparing digital ecosystems generally highlight Denmark as a country with a comparatively high level of digitalisation and e-readiness.

Figure 5.1. Gap analysis of the companies' assessment of the Danish FinTech ecosystem

- | | |
|--|---|
| 1) Access to a skilled workforce | 11) A well-developed digital infrastructure |
| 2) Access to the latest research and knowledge (e.g. universities, GTS-institutes) | 12) The investment tax rate |
| 3) A physical hub, where the FinTech community can meet | 13) Collaborative environment between public authorities and private sector |
| 4) Early stage events (e.g. hackatons) | 14) Willingness among established financial/FinTech companies to engage in innovation and development |
| 5) The company tax rate | 15) Access to finance (e.g. business angels, venture capital, public grants) |
| 6) Strong presence of established digital tech companies | 16) A strong financial services sector |
| 7) A high level of e-readiness in the population | 17) Density of start-ups |
| 8) Access to customers | 18) The income tax rate |
| 9) Access to accelerators and incubators | 19) Costs of doing business (e.g. labor costs, cost of living) |
| 10) A progressive regulatory environment | 20) Collaborative environment between companies |

Source: Oxford Research and RainmakingInnovation, n=46

While the gap analysis suggests that there is a great potential for strengthening the Danish FinTech ecosystem, the survey also shows that the general opinion among the companies is that Copenhagen on an overall level is an attractive place for doing business and attractive for starting a FinTech companies. In the survey, $\frac{3}{4}$ of the companies (74%) answered that Copenhagen is an attractive place for doing business, while only 17% regard Copenhagen an unattractive place for business. Also when it comes specifically to the start-up scene, 62% agree that Copenhagen is attractive for start-ups, while 21% do not find Copenhagen to be attractive for starting up a new FinTech company. These results show that a well-developed digital infrastructure, a high level of e-readiness, relatively low costs of living and an inexpensive workforce compared to other digital and financial hotspots makes Copenhagen an attractive place to do business.

5.4 WHAT CAN WE LEARN FROM GLOBAL FINTECH HUBS AND HOW DOES CPH COMPARE?

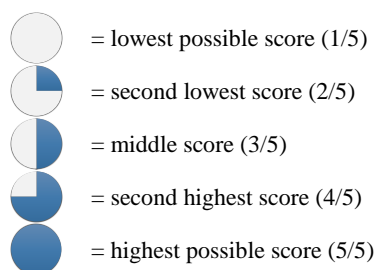
As a key analytical element, we have researched eight different international FinTech hubs to find good practices and inspiration on how to strengthen the FinTech ecosystem in Denmark and Copenhagen and to benchmark Copenhagen with the international FinTech hubs. We have studied four international FinTech frontrunners (New York, London, Singapore and Tel Aviv) as well as four cities more similar to Copenhagen (Stockholm, Amsterdam, Helsinki and Oslo). Shortly, the benchmark shows that **Copenhagen is currently far behind the global FinTech frontrunners but in a Nordic context, Copenhagen is ranked relatively well** only lagging behind Stockholm. However, the race is close and the other Nordic cities are also beginning to look into the growth potentials of FinTech.

Our analysis of the international FinTech hubs have shown that multiple cities around the world (also beyond the 8 analysed) are fighting an intense battle to become FinTech hubs. We have benchmarked the FinTech hubs on the following parameters, as we see these as defining measures for a FinTech hub:

- Vibrant FinTech start-up community
- Active established players
- Access to risk capital
- Political support and friendly regulator
- Access to talent
- Brand as a FinTech hub























































The parameters are ranked from 1-5. The rating 1 is given when the city does not perform at the parameter at all and is shown as an empty pie chart. The rating 5 is given when the city performs very well at the parameter and is shown as full pie chart.

Rating system



As the benchmark analysis in table 5.2. shows, Copenhagen is currently far behind the FinTech frontrunners on these parameters, but in a Nordic context Copenhagen is ranked well only lagging behind Stockholm.

Table 5.2. International benchmark of FinTech hubs

	Vibrant start-up FinTech commu- nity	Active estab- lished players	Access to risk capital	Political support and friendly reg- ulator	Access to talent	Brand as a FinTech hub
Copenhagen						
Stockholm						
Helsinki						
Oslo						
Amsterdam						
New York						
London						
Singapore						
Tel Aviv						

The benchmark analysis shows that NYC, London and Singapore are significantly stronger than the other cities when it comes to being a FinTech Hub due to general framework conditions and active policy settings allowing for innovation. The cities all share a set of business environment characteristics enabling the development of a thriving FinTech hub.

NYC, London and Singapore are all characterised by exceptional market access and robust financial services industries. The strong concentration of financial institutions in the cities provide beneficial conditions for a FinTech ecosystem with engaged and active established players as well as good access to funding. However, London and especially Singapore stand out when it comes to political commitment. London has accelerated its development as a FinTech hub the last two years through a concerted effort by the government, regulators, the City of London, technology start-ups and industry. Singapore has also positioned itself in the global FinTech ecosystem push-started by

extensive government support, funding and promotion. London and Singapore are proven examples that strong political commitment can create an attractive environment for funding and talent, thus starting an upward spiral and boosting the cities' brands as FinTech hubs.

The next tier is places like Tel Aviv and Amsterdam. Both Tel Aviv and Amsterdam have a strong culture within innovation and due to their smaller domestic market an international focus. Both cities also hold vibrant start-up scenes – especially within tech. Within FinTech Tel Aviv has a more mature ecosystem than Amsterdam powered by a vibrant FinTech start-up environment, strong political support and very good access to talent.

In the Nordics, Stockholm and Copenhagen fight to be a Nordic FinTech centre - with Helsinki and Oslo just behind. None of the Nordic cities excel in all parameters characterizing a FinTech hub. Nevertheless, each city holds some individual strengths. The FinTech scene in Stockholm is characterised by strong investor presence, good access to risk capital and events bringing international attention to the city. Helsinki's FinTech environment benefits from the city's IT sector and a substantially growing start-up scene manifested by the annual start-up festival Slush attracting international attention. Latest, Nordea has located their start-up accelerator in the city. Similarly, Oslo has a very strong IT sector and a few established FinTech players adding some volume to the industry. However, Oslo's FinTech community is still very nascent.

5.4.1 Key learnings

The key learnings from the global benchmark show that the following factors are important enablers for a successful FinTech eco system:

- **A dedicated home for FinTech start-ups and the community.** Level-39 in London is the prime example of how a centre of gravity can bring the community together and foster relationships between start-ups and established players.
- **Political commitment and regulatory support for the FinTech sector.** In London the Mayor and several MPs actively support and promote the FinTech sector locally and globally. Further, the UK regulation body FCA initiated Project Innovate in 2014, which is designed to help both start-ups and established businesses to learn about compliance and the specific rules and policies that are restricting innovation. In Singapore, another interesting initiative, the FinTech & Innovation Group (FTIG), has been set up with the aim of improving regulatory policies on new technologies and innovation in the financial sector.
- **An active financial services industry that is committed to help the start-ups through mentoring, incubators and accelerator programs.** In New York, there are now five FinTech accelerators run by either individual financial services providers (like Barclays and MasterCard) or by a consortium of banks (like Start-upbootcamp FinTech and FinTech Innovation Lab). Dozens of financial services providers and suppliers are therefore active in open innovation, pilots and mentoring of start-ups.
- **Available and accessible early stage funding for FinTech start-ups.** In Stockholm, NFT Ventures has been established. It is Stockholm's first venture capital firm that entirely focuses on the FinTech sector securing access to funding for companies on the way up. Bank Hapoalim has created a corporate venture capital platform in Tel Aviv targeting promising FinTech start-ups. The goal of the program is to advance innovation in the financial services sector, develop new products and services for Bank Hapoalim's customers, and support the growth of the Israeli FinTech industry.

- **Increase interaction and visibility among the companies and investors in the ecosystem.** In Amsterdam, they have launched the digital platform StartupDelta that offers insight into the entire start up ecosystem of the Netherlands, provide start-ups with a complete overview of potential investors, and give support, fiscal information and an overview of financial regulations.
- **Finally, high profile FinTech conferences are important to brand and position a city as an important hub, since they bring established players, start-ups, investors, regulators and media to town.** Singapore has for example succeeded in attracting both Sibos, Innogy, NextBank and Finovate in 2015 and that has hugely increased the branding of Singapore as a FinTech hub.

6. What needs to be done - recommendations

As the study shows, Copenhagen has several strengths to enhance and leverage to potentially become a leading Nordic FinTech hub. However, the growth potential will far from unlock itself. Despite a relatively strong financial sector, a number of established FinTech players, good collaboration across the sector, a series of FinTech startups and scaleups as well as a good base for innovation and research, the current FinTech scene is relatively small and scattered: Not many established players are active in the ecosystem and few are driving significant innovation programs. FinTech companies, especially startups, also lack a closer relationship to the regulatory bodies and a stronger commitment from politicians to facilitate the development of the FinTech sector. At the same time, European and Nordic cities like London, Stockholm, Amsterdam and Zurich are actively pushing to position themselves as world class FinTech hubs. If we do not take action now Copenhagen is likely to have lost the FinTech train for good. For Copenhagen to become a leading Nordic FinTech hub it all starts with a strong ambition and will to do something. And doing it BIG. And FAST. In order to succeed both private and public players need to join forces and all initiatives should build on and supplement existing initiatives and platforms.

As mentioned earlier in the study we have identified six key enablers for developing a vibrant and successful FinTech hub. Within these six key enablers we have further identified 17 concrete recommendations for strengthening the Copenhagen FinTech ecosystem. These recommendations are based on what we have learned - by looking at international benchmarks - have been key success factors for building international FinTech hubs. In addition these recommendations aim to address Copenhagen's relative weaknesses and key strengths as identified in this report.

In order to develop and establish Copenhagen as a leading Nordic FinTech hub the study shows the entire FinTech ecosystem needs to be strengthened. From this outset the majority of the recommendations are targeted the development of a stronger FinTech startup scene. This is where we have found the Copenhagen FinTech ecosystem the weakest and least developed and where growth potential within FinTech especially seems to lie. However, we have also identified some important recommendations to strengthen the position of the established players in the ecosystem. It should be noted that it is especially, the collaboration and the dynamics between the stakeholders in the ecosystem that are crucial for developing a strong Danish FinTech scene, create more innovation and attract investments and talented people.



In the following sections the 17 recommendations will be presented. Hereafter, a section will discuss a prioritisation and an approach for implementing the recommendations. Finally, an estimate will indicate the expected costs and benefits of implementing the recommendations. It should be noted that the recommendations are closely intertwined and many of them support and supplement one another. For this reason it is difficult to give a precise estimate of impact of each individual recommendation. Thus, the costs and impact are indicated on an aggregated basis.

6.1 A VIBRANT STARTUP FINTECH COMMUNITY

A vibrant startup FinTech community is essential to build and strengthen the pipeline of FinTech businesses ventures looking to call Copenhagen home. There is a need to create critical mass of activities and ensure young startups can get the support they need. CFIR and the Innovation network for Finance IT (Innovationsnetværket for

Finans IT) are already arranging seminars and network events. However, for Copenhagen to become a leading Nordic FinTech hub the community needs further enhancement.

Establish a home for the FinTech community and startups

The FinTech community needs a centre of gravity. The physical place should be a co-working space where startups can work from, where FinTech related events take place and where investors and established players can come and engage with startups and each other. Ideally, the co-working space would be able to accommodate aspiring entrepreneurs and people on the outlook for their next venture in a café area or flex desk area to facilitate day-to-day connections. To facilitate a vibrant ambiance the co-working space should be open to both tenants of the co-working space as well as people and organisations wanting to engage with the community. The space should be minimum 800-1,000m² to ensure it can accommodate a critical mass of startups and activities. In addition it should have an event space to be able to at least host smaller events like training, smaller hackathons and meetups.

The above model is proven in places like blk71 in Singapore, B. in Amsterdam as well as Level-39 and Rain-makingLoft in London. The impact of such a home is that it will bring the community together, foster collaboration, knowledge sharing and quality networking.

It is important that a co-working space like the above is not done by players who want to maximize rent revenue, but instead by someone who wants to maximize the value for the FinTech community.

Ensure a high activity level and support to launch new startups

In order to facilitate more people to become entrepreneurs within FinTech, there need to be events and support mechanisms in place to help with that critical initial step of making the jump, finding and improving an idea, plus finding co-founders to create the startup with.

Some of the best tools for that are hackathons and meetup events where people get together and share ideas and information. Examples of other fruitful events are match-making events, which bring entrepreneurs/startups and established players together to identify ways to collaborate. The more events, the better. A high activity level is important to create critical mass and drive action.

There is no direct business model for anyone to sponsor/fund these kind of early stage activities fostering new innovation and startups. It is therefore important to find funding from established players and/or public sources who have a long term perspective and can see the strategic value for themselves and the entire FinTech community.

Facilitate access to mentors

A critical component at this stage of creating new startups is access to mentors, including successful entrepreneurs, subject experts and industry professionals. There should therefore be established a pool of quality mentors, who are willing to support new startups with their experience and network. The right type of mentors are willing to give back to the community for free and there should therefore not be any costs implications of this recommendation.

Establish a support program to help startups grow and internationalise

Once startups have developed their initial product and solutions, they need help to grow – and hopefully beyond Denmark to achieve export revenues. A proven tool to achieve this is a startup accelerator. A startup accelerator is typically run as a 3-6 months full time program where a cohort of 8-12 startups are provided with intense support that helps the startups grow their businesses with the assistance of a core team of proven entrepreneurs plus a big pool of

mentors. The startups are typically given some cash to cover their living costs during the program. In return startups typically give up 6-10% of their company.

A startup accelerator also has a huge symbolic value (as seen with Nordea's accelerator in Helsinki) and follow-on impact in the ecosystem, since it can function as a great tool to attract and connect foreign startups, investors and established players. A good example is Startupbootcamp's FinTech accelerator in Singapore, which was the first FinTech accelerator in the region. The accelerator helped catalyse an upward spiral with startups moving to Singapore, the establishment of more FinTech accelerators and dedicated FinTech VC funds etc.

Today, the best startups in Europe are likely to go to the FinTech accelerators in London due to the comparative advantages of London as a FinTech hub. This leaves the next level of FinTech startups to places like Amsterdam, Zurich and Copenhagen. If it is decided to establish a FinTech accelerator in Copenhagen it should therefore be acknowledged that it will take time to make Copenhagen attractive enough for the very best international startups. In the meantime an accelerator can still help catalyse the entire development of Copenhagen as a FinTech hub, help Danish startups plus help attract some foreign talent.

If it is decided not to implement a startup accelerator immediately, then a smaller support program should be established, which at least can help early stage startups with some training and support of relevance to startups who want to grow and internationalise their businesses.

6.2 ACTIVE ESTABLISHED PLAYERS

Established players play a critical role in improving and strengthening the FinTech ecosystem. Startups are important and can sometimes be faster and more innovative than established players. However, established players have the power to make big changes that often create more jobs and impact than most startups.

Engage with startups and support the ecosystem

The financial sector in Denmark has a tradition for value-adding cross-organisational collaboration. This collaboration has fostered FinTech companies such as BEC, FDC, SDC and Bankdata. Established players should proactively seek to further this collaboration both horizontally with one another and vertically with entrepreneurs, startups and scaleups.

Established players can proactively engage in collaboration with startups – also referred to as open innovation - in the form of being important first pilot customers, adding value as mentors, offering access to data, co-creating new innovative products or giving access to open APIs. As an example of the latter Saxo Bank has launched OpenAPI allowing partners, clients and external developers access to their trading infrastructure.

Additionally, established players need to invest in building and supporting the ecosystem. It takes funding to build the ecosystem – being it running hackathons, meet ups, startup competitions or an accelerator – and without contribution from established players the FinTech ecosystem will not develop fast enough. London is a prime example of where dozens of banks and other financial institutions put tens of million euros into building the ecosystem each year – and the impact is obvious.

Strengthen internal innovation initiatives

Established players should also seek to enhance their internal innovation and leverage their own assets like employees, brand, data and technology. Best practice tools to facilitate intern innovations include innovation labs, internal hackathons and launch of separate innovation departments. As an example Danske Bank has invested heavily in internal

innovation, which has resulted in increased exposure and attention of FinTech innovation – not least due to the success of Mobile Pay. Plus it has created a lot of jobs. Another result of successful internal innovation is Saxo Bank's white label multi-asset online trading platform.

6.3 ACCESS TO RISK CAPITAL

Access to funding is one of the most critical components of a thriving FinTech ecosystem, since startups need risk capital to survive, develop and grow. It has become easier to get a startup funded in Denmark, however, improvements are still required to make Copenhagen an attractive place for FinTech startups and investors.

"What makes the Nordics attractive from a FinTech perspective is a culture that includes a high penetration of smart phone use, a consumer public open to testing and trying new products. Combine this with plans to strengthen the ties between banks, FinTechs, regulators, venture capitalists, and industry bodies will see the Nordics continuing to grow in FinTech strength".

Liz Lumley, MD Startupbootcamp FinTech London

Encourage more dedicated FinTech investors

The existing venture capital companies (VCs) do not appear to have specific focus on FinTech startups. FinTech is seldom mentioned as one of their investment and focus areas and none of the VCs seem to have a dedicated partner who has expertise within FinTech. Similar there does not seem to be many business angels with specific focus on FinTech startups.

As a starting point it would therefore be good if existing VCs would market their interest in FinTech startups and hire a partner who knows about the specific opportunities and challenges of launching and growing a FinTech startup. In addition a dedicated FinTech fund by one or more of the big banks or pension funds would make a big difference, similar to the corporate VC funds run by HSBC, Santander or BBVA.

The government should consider establishing a matching fund mechanism to gear private investments – similar to what is done in Singapore.

Make it more attractive to be a tech investor in Denmark

The Government should consider implementing investment incentive schemes like SEIS and EIS in England, which has hugely grown the access to investment capital from business angels by introducing favorable tax credits and no capital gain tax on investments in startups. The existing and newly suggested initiatives in Denmark are not judged to have any significant impact on improving the situation in Denmark. The Government could for example consider moving funding from Væksthusene to the above recommended tax incentives for investors and hence move towards a mechanism where the market (the investors) decides where money shall flow by putting their own capital, instead of having hired people allocating funds.

6.4 POLITICAL SUPPORT AND FRIENDLY REGULATOR

Singapore and London have proven how political commitment and a friendly regulator can give a city or country a competitive edge and help attract talent and drive innovation. The Danish Government, the Municipality of Copenhagen and the regulatory authorities should therefore step up and help the FinTech sector to develop by showing support and creating more favorable framework conditions as discussed below.

Provide political and financial support

The Municipality of Copenhagen and the Government can be important enablers by supporting the FinTech sector as follows.

- First of all, the Municipality of Copenhagen should according to the level of ambition establish a vision for the field to drive and align underlying initiatives. This could for example be as a continuation

of the digital vision of a cashless society defined by the Innovation network for Finance IT (Innovationsnetværket for Finans IT) and 27 other business organisations.

- To increase awareness and exposure of the Copenhagen FinTech sector the mayor and MPs should participate in local, regional and global FinTech events, similar to what Boris Johnson is doing for London.
- The Government and the Municipality of Copenhagen should work together on removing barriers to success, e.g. by making it easier for foreign talent to get visa as per 3.5 and by and making it more attractive for investors to invest in tech startups as per 3.3.
- To improve data accessibility The Municipality of Copenhagen should further existing projects of CPH Solution Lab and The Big Data Projects of The Danish Industry Foundation, augment the specific targeting of the FinTech scene and promote the projects in the ecosystem. Denmark is already known as a highly digitalized country with access to much data compared to many other countries – and this strength could be leveraged by offering test beds and living labs acting as a platform to attract foreign FinTech ventures. It is important to note that the high digitalization in itself is not necessarily perceived as strengths by FinTech ventures as it can be questioned whether accustomed solutions can be exported since other countries might not have circumstances where solutions can be rolled out.
- The public sector should not run activities in the ecosystem – that should be left to private initiatives to avoid it becomes a politically driven agenda. Similar, the public sector should not fund initiatives alone – the private sector should contribute as well. However, the Municipality of Copenhagen could for example provide 25-50% match funding to ecosystem development projects financed by private actors to help stimulate the ecosystem development activities and facilitate the creation of jobs and economic growth in Copenhagen.

Encourage a more friendly regulator

Established players and startups will by default push the boundaries of what can and cannot be done within the existing regulatory framework. This includes pushing for changes to the regulation to for example allow new business models and technology like crowd funding, peer to peer lending and the usage of blockchain technology and crypto currencies.

In order to provide the best conditions for new innovation to happen, it is therefore recommended that The Danish Financial Supervisory Authority (Finanstilsynet) adapt a mindset of not just being an administrator of the regulation, but instead work proactively with innovators to help navigate within the existing regulation, but who is also willing to sit down and look at how existing regulation might need to be adapted to fit with future innovative technology and business models. Ideally, The Danish Financial Supervisory Authority (Finanstilsynet) would dedicate resources to have “open office hours”, where established players and startups could meet the regulator in an informal environment and get support and work together. Alternatively, a neutral person should be available to conduct the same role.

6.5 ACCESS TO TALENT

Denmark and Copenhagen generally benefits from access to a highly qualified workforce, however, there is a need to upskill existing employees in established players to meet the future demands within FinTech. In addition an effort should be done to attract foreign talent.

Upskill and leverage existing employees in established players

The established players will need to upskill existing employees or attract people with different skill sets in order to meet the demands of the future, which will see the nature of many jobs changing. Further, such upskilling or attraction of new talent is required for the established players to be able to innovate and develop new FinTech solutions. It is

therefore recommended that relevant stakeholders such as the sector's unions and industry bodies in collaboration with universities or private suppliers of training programs initiate a combination of dedicated training programs focused on the intersection between IT and financial services, and a mini MBA in intrapreneurship or entrepreneurship. A good example of a result of stakeholder collaboration is the newly launched master in Cyber Security at DTU, an initiative driven by CFIR, Centre of Cyber Security, IBM and DTU.

Ensure a pipeline of competencies and applied research

Denmark already holds a good base for research and innovation projects within the field, not least within the space of predictive analytics, big data and mathematical modeling. It is recommended that the universities to a higher degree collaborate with one another as well as directly with established players and startups to ensure relevant competencies are fostered as well as the newest knowledge and tools are deployed.

To ensure conducive conditions for knowledge sharing, a FinTech institute across universities could be established. Such an institute could play an important role pushing for the commencement or tweaking of educational programs within the intersection of financial and digital technology competencies in order to meet the severe shortage in the ecosystem. The Innovation network for Finance IT (Innovationsnetværket for Finans IT) could be a relevant stakeholder to look further into this initiative.

Encourage more students to become entrepreneurs and intrapreneurs

Compared to other countries Denmark still has relatively few young people who decide to set up their own business or work with innovation within big companies. The universities and business schools can help rectify this by for example arranging hackathons for the students giving them an opportunity to get practical first-hand experience with innovation and allow the students to experiment in a risk free environment. Finally, the universities and business schools should be offering more entrepreneurial courses as part of curriculum.

Attract international talent

The FinTech ecosystem is operating at global scale. If Copenhagen has an ambition to be a true regional hub, then it also needs to attract foreign talent who can both bring new critical competencies but also just fresh ideas, diversity and critical mass to the Copenhagen FinTech scene.

Startups are willing to move to another country if there is access to customers, capital and/or talent. This therefore supports the earlier recommendations of making sure that the Copenhagen FinTech scene works closely with established players to for example act as pilot customers and the need to improve the access to early stage funding for FinTech startups.

Assuming those parameters are in place, then Copenhagen can attract foreign talent through running international startup competitions such as Venture Cup and Creative Business Cup, through running a startup accelerator, or through giving foreign talent a grant if they set up a business in Copenhagen.

"The most important factors for creating a city where several companies can build products that will eventually become large organizations are: Access to solid developer and product talent, many other teams working on problems attacking the same industry and a strong local angel and early stage VC presence."

Jesse Podell, Managing Director-Startupbootcamp NYC

Improve visa for foreign entrepreneurs

To facilitate the influx of non-EU talent, visa and work permission rules needs to be revisited, since many talented entrepreneurs today come to Denmark and then have to leave again because of visa problems.

This could for example be done by establishing a special entrepreneur visa as has been done in the UK.

6.6 BRAND AS A FINTECH HUB

Coordination, communication and promotion are important factors to engage, strengthen and showcase Copenhagen as a FinTech hub.

Conduct communication and marketing to promote and strengthen the community

It is recommended to launch a website to promote Copenhagen as a FinTech hub locally, regionally and globally. The website shall act as the gateway for anyone interested in FinTech in Copenhagen – being it startups, established players, investors etc. The website should display:

- An overview of the FinTech ecosystem landscape: who are the startups, who are the investors, which established players are active and open for conversations as well as links to existing overviews of the general startup ecosystem as inno-overblik.dk.
- Promote Copenhagen's value proposition for FinTech entrepreneurs and companies
- Showcase success cases
- A calendar with all FinTech related activities
- News
- Press
- Latest research
- Go to places for first time entrepreneurs

In addition social media should be used to ensure constant engagement of community

- Twitter, Facebook, LinkedIn and other social media
- Suggested hashtag: #CPHFINTECH
- Collaboration with Copenhagen For The WIN #CPHFTW

A full time resource should be dedicated to setting up and maintaining the website, creating content, conducting social media noise and act as connector across the ecosystem.

Bring top conferences to Copenhagen to help brand Copenhagen as a FinTech hub

In order to position Copenhagen in the global FinTech landscape, Copenhagen should aim to host at least one high profile international FinTech event each year. This is an effective mean to attract thought leaders, established players, investors, startups and media. Conferences like Pioneers Festival and Slush are examples of how conferences have helped position Vienna and Helsinki at the global scene. Copenhagen is going to host the renowned conference Money20/20, when it launches its European pendant in 2016. It is a good chance to further position Copenhagen as a FinTech hub and host similar events.

In addition an annual local/regional FinTech event should be conducted to bring the community together, celebrate success and keep pushing the FinTech agenda, maybe inspired by NextBank or FinTechStage.

Table 6.1.: Recommendations

A vibrant FinTech community	Active established players	Access to risk capital	Political support and friendly regulator	Access to talent	Brand as a FinTech hub
<ul style="list-style-type: none"> • Establish a home for the FinTech community and startups • Ensure a high activity level and support to launch new startups • Facilitate access to mentors • Establish a program to help startups grow and internationalise 	<ul style="list-style-type: none"> • Engage with startups and support the ecosystem • Strengthen internal innovation initiatives 	<ul style="list-style-type: none"> • Encourage more dedicated FinTech investors • Make it more attractive to be a tech investor in Denmark 	<ul style="list-style-type: none"> • Provide political and financial support • Encourage a more friendly regulator 	<ul style="list-style-type: none"> • Upskill and leverage existing employees in established players • Ensure a pipeline of competencies and applied research • Encourage more students to become entrepreneurs and intrapreneurs • Attract international talent • Improve visa for foreign entrepreneurs 	<ul style="list-style-type: none"> • Conduct communication and marketing to promote and strengthen the community • Bring top conferences to Copenhagen to help brand Copenhagen as a FinTech hub

6.7 IMPLEMENTATION OF THE RECOMMENDATIONS

This report lists a range of recommendations to make Copenhagen a FinTech hub. In an ideal world all or most of the recommended initiatives would be implemented within the next 1-2 years. To conduct a realistic prioritisation we need to consider costs, ease of implementation and impact. With that in mind we have selected a series of actions to focus on in 2016: four concrete actions related to leverage the established FinTech sector and nine concrete actions related to develop the FinTech startup ecosystem. We call it “Project CPH FinTech Hub”.

Prioritisations related to enhancing the established FinTech sector

The established players within the Danish FinTech scene have potential to unleash a lot of value if furthering their foundation for innovation. However, if the established players do not take further action, revenue and jobs are under pressure. Recently, Jesper Nielsen, Head of Danske Bank's development unit ‘MobileLife’ claimed that up to 35 % of the revenue and jobs in the Danish financial sector is at risk as being taken over by disruptors – of which many are likely to be from outside Denmark²¹.

²¹ Børsen 27. November 2015

It is recommended that the established Fintech sector focus at the following actions:

- **Upskill existing employees and attract new talent** who jointly can help innovate and fulfil the roles of a future where IT and digital solutions will be more integrated within the financial services industry.
- **Invest more in developing internal innovation** to leverage existing resources
- **Engage in open innovation and help build the startup FinTech ecosystem**, since it is within the intersection of startups and established players that a lot of innovation and not least growth can happen.
- **Establish structured collaboration between universities and science institutes** to further applied science and research.

Prioritisations related to building a startup ecosystem - Launch Project CPH FinTech

To strengthen the entire FinTech ecosystem it is critical to foster a more conducive environment for the FinTech startup scene. In order to do this it is recommended to prioritise nine concrete actions in 2016 boosting the FinTech startup scene and hence jump-starting an upward spiral attracting more talent, support programmes, research, angel investors, venture capitalists and established companies.

Establish Project CPH FinTech Hub – prioritized initiatives for 2016

The impact and synergies are closely linked across the recommendations. However, we have listed the recommendations below in a prioritized order by taking the most effective tools to boost the ecosystem into consideration.

Thus, as an outset Project CPH FinTech Hub should focus on implementing the following initiatives in 2016:

- **Establish a FinTech co-working space in the centre of Copenhagen** to ensure a centre of gravity where FinTech startups, investors, established players and other stakeholders in the ecosystem can meet.
- **Run multiple early stage activities** like hackathons, meet ups, etc. to facilitate people and stakeholders in the ecosystem getting together, sharing ideas and information and finding ways to collaborate.
- **Launch an accelerator or another support program** for growth start-ups to attract and connect foreign start-ups, investors and established players.
- **Establish a pool of high quality mentors** including successful entrepreneurs, subject experts and industry professionals to support new start-ups with their experience and network.
- **Work closely with established players** to increase their engagement in the FinTech community in order to leverage their resources and enhance collaboration and open innovation.
- **Connect investors and start-ups** and encourage more investors to focus on FinTech to establish a more conducive environment for FinTech start-ups and scale-ups.
- **Lobby the Government and Municipality of Copenhagen** to support the FinTech agenda, including improving visa rules and making it more attractive to be tech investors.
- **Encourage the regulator to work closer with innovators** to support them navigate within the existing regulation and adjust policy setting for regulation obstructing innovation.
- **Conduct communication and marketing** to coordinate and engage the ecosystem as well as promote Copenhagen as a FinTech hub at a national and international level.

The above initiatives have been chosen, because international best practice and experience have shown that these are the critical initial building blocks for a successful ecosystem. In addition these are initiatives, which can be acted upon now and which are not too expensive. Finally, they will have a significant impact on for example job creation.

Collaborating across the sector and building on top of existing projects

It is recommended that the entire sector come together to collaborate and help finance and implement the recommendations in this report. Copenhagen has a relatively small FinTech scene and to compete with other cities, there is a need to join forces and ensure that new initiatives build on top of existing initiatives.

To ensure collaboration and coordination it is therefore encouraged that representatives from both public players such as the Municipality of Copenhagen, regulators, industry bodies, universities and from private players such as FinTech investors, established players, FinTech startups and of course existing FinTech organisations such as CFIR and Innovationsnetværket for Finans IT. The network partners should commit to contributing to making Copenhagen a FinTech Hub. Each partner should take action in relation to those recommendations where they have influence and can make an impact. It is recommended that the partners meet on a quarterly basis to coordinate and prioritise initiatives plus share experience from the preceding quarter.

Establish an implementation team for Project CPH FinTech Hub

A project like Project CPH FinTech Hub will require a full time team to set up and run the recommended activities. This will include a MD or similar senior person who has the experience in building ecosystems. In addition there needs to be profiles within the team to cover event management, community building, designing and delivering training and support programs, marketing and communication plus other support staff to execute the various activities.

The implementation team should have a mandate from the organisations who decide to participate in funding the project and be allowed a certain freedom to execute the activities as they see fit. In addition, the implementation team should work with the wider network of partners as described above and ensure that all activities build on top of and complement existing activities in Copenhagen.

Funding and estimated costs of Project CPH FinTech Hub

Funding should be secured to run Project CPH FinTech hub for at least the next 3 years. This is essential to ensure the project does not become a one off activity but gets the commitment and time to develop and establish Copenhagen as a FinTech hub.

It is estimated that the total costs of implementing a critical mass of activities in Copenhagen as per “Project CPH FinTech Hub” will be approximately €1m p.a. depending on the exact ambition level. The costs would approximately be split as follows:

- 10-15% would go to cover the expected costs of a co-working space (what cannot be covered by rent from tenants)
- 60-70% would go to cover salaries of the implementation team plus experts who are brought in for selected activities
- 5-10% would go to cover travel, catering, material and other out of pocket costs
- 5-10% would go to building a website and running communication on a full time basis
- 5% would go to cover admin, accounting, telephone, IT etc.

The funding should come from a combination of public and private players. It is recommended that at least 50% of the funding come from private players. Assuming the Municipality of Copenhagen for example would contribute with €250,000 p.a., then 6-10 private entities could each contribute with €100,000 p.a., which is similar to what large companies typically contribute with in comparable international projects.

If the support program for growth startups shall include a full blown accelerator of international top quality, then the total costs would be closer to €2m p.a.

The cost estimates are based on Rainmaking Innovation's experience of implementing similar projects in more than 15 countries across Europe, Asia and US the last 5 years.

Impact of Project CPH FinTech Hub

Project CPH FinTech Hub will have a significant impact of job creation, innovation, export and positioning of Copenhagen internationally. For the purpose of this report, we have chosen to use job creation within startups as a measure of impact of the Project CPH FinTech Hub.

It is estimated that the project (excluding the accelerator) would contribute to the creation of 15-30 extra FinTech startups per year compared to the situation today. With an estimated survival rate of 60% over the a 5 year horizon and with an estimated 10 employees on average in such startups (some startups will be entirely new by the end of 5 years and some will be 5 years old), then the project would contribute to the creation of additional 450-900 jobs within startups. This is without assuming that any startups really take off and maybe double this number.

If it is decided to implement an accelerator, then the experience from Startupbootcamp - which has run 31 accelerators across the world - is that one can expect to attract another 50 startups, (10 per year) of which 70% are likely to stay in Copenhagen. 80% of these startups can be expected to be alive after 5 years (the survival rate is higher for the accelerator startups compared to an average for all new startups, since startups entering an accelerator will already be 1-2 years old and have been chosen from hundreds of applicants) and will on average have 20 employees. It will therefore in total contribute with another ca. 550 jobs.

The total job creation potential of Project CPH FinTech Hub is therefore ca. 1,000-1,450 new jobs in startups alone. This corresponds to trebling the number of people employed within FinTech startups today. It should be noted that this is based on average numbers and not taking into account the impact if and when some companies really take off and create hundreds of jobs.

A note on the recommendations not covered by Project CPH FinTech Hub

The activities not covered by Project CPH FinTech Hub are still important and relevant, however, they have not been prioritized for 2016. Either because they take a long time to implement (e.g. establishing a dedicated FinTech fund which is likely to take minimum 12-18 months); or because they are less critical short term (e.g. a pipeline of applied research); or because it is hard for a project group to influence (e.g. getting more corporates to invest in internal innovation projects); or because it is likely to happen anyway (e.g. up-skilling of employees, which established players are expected to anyway do something about).

If established players put more focus on internal innovation they could, additionally, drive significant growth, export and job creation, which at least could match the impact estimated within startups above.

Action needs to start now

Recent estimates indicate that up to 35% of the revenue and jobs within the financial service sector jobs are at risk from FinTech innovators. At the same time multiple cities around the world are being very aggressive in embracing FinTech innovation and take part in this disruption, which will move huge value and thousands of jobs across borders. Copenhagen therefore needs to act now to not lose out and to take part of the future growth opportunities within FinTech.

7. International case studies

As a part of the study, we have carried out eight international case studies.

The international cases studies are divided into two groups. Firstly, case studies are made focusing on international frontrunners in FinTech to analyse state of the art examples on initiatives. Secondly, four most similar case studies to Copenhagen have been carried out. The main goal is to look at cities similar to Copenhagen and examine successful initiatives and trends.

The case studies include:

International frontrunners – most different cases	Similar FinTech hubs – most similar cases
New York City	Amsterdam
London	Oslo
Tel Aviv	Helsinki
Singapore	Stockholm

We have conducted thorough desk research on relevant literature to study the eight selected FinTech hubs and carried out 18 semi-structured interviews with international FinTech experts and stakeholders to identify trends, best practices, strengths and weaknesses of the local FinTech ecosystem. In addition, a survey among a panel of international experts has been carried out with the purpose of evaluating their local ecosystem focusing on 1) assessing the importance of a number of conditions for developing a strong FinTech sector and to 2) assessing how well the local ecosystem performs on these parameters.

In the following, the case studies for each of the FinTech hubs is presented.

New York | General framework and conditions

The New York scene is characterized by a diverse array of industries as well as a vibrant entrepreneurial and tech eco-system powered by the city's wide talent pool, communities, funding and government support aiming to accelerate growth.

New York is a global hub of international business and commerce within a diverse array of industries such as finance, media, advertising, fashion, art, real estate and food. The expertise of the various industries and communities taps into a vibrant start-up scene as well as a strong and substantially growing tech scene leveraged by the city's numerous co-working spaces, accelerators, incubators and industry engagement. The conducive business environment entails access to substantial funding from financial institutions, venture capital funds, private investors and government funds. The business scene further benefits from a favourable tax system, good infrastructure and talent pool from the regions renowned universities such as NYU and Colombia University.

"Cornell University and our extraordinary partner, The Technion-Israel Institute Technology, are deeply gratified to have the opportunity to realize Mayor Bloomberg's vision for New York City: To prepare tomorrow's expanding talent pool of entrepreneurs to work with the city's key industries in growing tomorrow's innovation eco-system"

David J. Skorton, President, Cornell University

- **The local government supports the city's start-up scene** through NYC Business Solutions Centres, free one-stop-shops providing technical assistance, Business Mentor NY, a free social network allowing entrepreneurs and volunteer business mentors to connect and Digital.nyc in 2014, an online hub of the city's start-up and technology ecosystem.
- **New York's tech cluster Silicon Alley** has fostered WeWork, a workspace provider valued \$10 billion, Sprinklr, a social media management firm valued \$1.2 billion and AppNexus, a cloud based software company valued \$1.2 billion. Others include Shutterstock, Tumblr, Gilt Groupe, MongoDB, Etsy, Buddy Media, Warby Parker, Kickstarter, Gerson Lehrman, and OnDeck Capital. Venture and angel funding are increasing, large Internet companies including Google and Facebook are growing their New York offices, and Cornell and Technion are collaborating to build a large engineering campus on Roosevelt Island.
- **New York houses over 50 co-working spaces** such as WeWork, New Work City, Fuelled Collective and Alley NYC (legal advice, cloud hosting and HR solutions) as well as communities unifying the tech and start-up scene
- **New York offers several accelerator programs** in general boosting the start-up scene

New York FinTech scene | Zooming in

The New York FinTech eco-system is catalysed by established financial players aggressively pursuing digital transformations in various forms, from partnerships to acquisitions to strategic investments, thus turning New York into a top global FinTech cluster – only second to Silicon Valley.

New York has a global leading position within global financial services and is home to JP Morgan Chase & Co, Citigroup, Banks of New York Mellon. New York's financial district, referred to as FiDi, is anchored by Wall Street, which among others is housing New York Stock Exchange and NASDAQ, the world's largest stock exchanges by market capitalization and trading activity.

The city's hegemonic financial services industry ensures the FinTech eco-system close access to funding, potential customers and a deep talent pool of individuals with an intricate understanding of the financial services industry. The eco-system is further, powered by established communities and a strong engagement from established financial players forming their own FinTech accelerators as well as platforms and labs for discovering emerging technology.

The advantageous environment makes New York's FinTech market subject to the fastest growth in US. With a CAGR 31% over the past five years the New York FinTech market is increasing twice as fast as Silicon Valley; the market is furthermore expected to double by 2018.

New York FinTech start-ups are among the most successful in developing innovations that address some of the trends that experts are seeing on a national level: Crypto currency, cloud computing and automated investing advisory services.

Initiatives and support strengthening the FinTech ecosystem

The FinTech ecosystem in NY in general benefits from attention and support from central public bodies, such as the NY Governor, and large established financial and FinTech players such as Barclays, Bank of America, MasterCard and American Express. New York City's Governor has also expressed his strong support to the New York tech scene and has launched a start-up program that aims to attract tech start-ups across the state and foster cooperation with R&D resources by creating tax-free zones on selected college campuses. The FinTech ecosystem is also kept vibrant by several strong FinTech community building initiatives. In short the New York FinTech ecosystem is especially supported by:

The New York FinTech Ecosystem

- **New York's financial services industry** account for more than 35% of city's employment income and employs approximately 345.000 workers.
- **43.000 professionals** is currently working in New York's FinTech sector.
- The New York FinTech market is with a CAGR of 31% **the fastest growing FinTech market** in the US
- New York's booming FinTech scene especially seems to be fueled by the combination of a leading global finance position and **strong support from large established FinTech players**

"As a large organization, you need a ready supply of new ideas, insights and technologies, not just from the inside but also from the outside. Working closely with the energetic FinTech ecosystem is really useful for us, because we can learn a lot from these companies and share with them the factors that are important to our customers"

James Dolphin, Capital One's chief information officer for Retail and Direct Banking

- **Strong FinTech communities** including ValueStream, MeetUp FinTech NY and Empire Start-ups; all throwing FinTech events, seminars, conferences in order to strengthen the eco-system
- **Several high profiled FinTech accelerator programs and innovation events** supported or initiated by large established players including MasterCard Start Path, Barclays Accelerator, The FinTech Innovation Lab (Fund for New York City and Accenture), Technology Innovation Summit (Bank of America)
- **The START-UP NY program launched by the New York City’s Governor**, which is an initiative aiming at attracting tech and digital start-ups and catalysing their collaboration with advanced research laboratories and R&D resources

Selected support initiatives | The FinTech Innovation Lab

The FinTech Innovation lab is a particularly interesting corporate accelerator program helping FinTech start-ups to develop.

The FinTech Innovation Lab is an annual 12 week accelerator program that brings together early stage financial technology companies and the world’s leading banks.

Held in a collaborative, non-sales environment, the program is an opportunity for the participating start-ups to work with potential future customers, validate propositions, gain insights into the banking sector and develop relationships with senior industry executives. Entrepreneurs developing potentially game-changing technologies for financial services—particularly in the areas of big data and analytics, mobile and wireless, payments, risk management, security, compliance, and social media and collaboration technologies—are selected to participate in the program.

Accenture launched the lab in New York in 2010 in collaboration with the Partnership for New York City and have since developed the program in London and Hong Kong where the three programs run counter cyclically. The motivation for New York to engage was threefold:

1. To help grow the enterprise tech sector by leveraging the large concentrations of financial service company, thus bringing New York job creation
2. Bringing more investment money into the market place, and
3. Getting New York on the map as part of the ecosystem in FinTech.

So far the companies involved have raised over 100 million dollars, created more than 130 jobs and have started to create customer traction and customer revenue.

London | General framework and conditions

The London scene is a leading international business centre due to a combination of fixed factors and policy choices – the interaction between these has enabled the emergence of a range of industry clusters.

London has a historical hegemony as a leading international business centre due to a time zone that allows it to act as a bridge between the US and Asian markets as well as a native language dominating the international business scene. Thus, London has great interconnectivity with global markets giving access to a global customer base as well as a large indigenous and technologically sophisticated consumer market.

Additionally, London has a business friendly environment benefitting from a competitive regulatory environment and extensive government support; e.g. the local government is not elected by the resident population but instead by resident businesses. London's strong international economic status is further supported by its leading European position in terms of foreign direct investment, thus providing access to capital. In addition, UK has incentivised business angels to invest in start-ups via their Entrepreneur Investment Schemes (EIS/SEIS) and their Venture Capital Trusts relief (VCT).

- **The London business scene has fostered one of the most successful start-up ecosystems in Europe** powered by a wide range of support network with more than 35 incubators and accelerators, capital infrastructure, events, physical hubs and diverse talent.
- **The London business scene has also fostered a booming tech cluster** in East London: Tech City also known as Silicon Roundabout, which is home to more than 1.500 tech companies. Cisco, Facebook, Google, Intel and McKinsey & Company are among the companies that have invested in the area; and several of the city's universities are academic partners in projects based in the cluster.
- **The thriving business scene benefits from a skilled talent pool** pipelined by renowned institutions such as London School of Economics, London Business School as well as University of Oxford and University of Cambridge in South-eastern England.

London attracted 381 FDI projects in 2014 securing employment of 3,470 professionals (E&Y 2015).

The London FinTech Scene | Zooming In

The London FinTech scene has favourable framework conditions and further benefits from a strong effort of alignment between different stakeholders in the ecosystem; government, regulators, industry and FinTech start-ups communities.

London is counted among the leading financial services hubs in the world. The city is home to numerous financial institutions; among these Bank of England, the European Banking Authority and London Stock Exchange, the most international stock exchange and the largest in Europe. The financial district at Canary Wharf further includes the global headquarters of some of the world's largest banks such as HSBC and Barclays. London's historical dominant position in the financial service sector entails a strong financial service infrastructure, sizable funding as well as a high rate of a knowledge-intensive service employment tapping into the FinTech ecosystem.

London is home to approximately 50% of FinTech startups in Europe

London's FinTech community is leveraged by a physical proximity between the city's clusters of financial services and technology, creating prosperous spill over effects.

Initiatives and support strengthening the FinTech ecosystem

London has the most vibrant FinTech scene in Europe powered by conducive framework conditions, active policy settings and a strong community.

- **The ecosystem benefits from a government that has accelerated the development of London as a FinTech hub** over the past 2 years. The UK Trade & Investment (UKTI) and the City of London has played an active role in fostering innovation and investment within FinTech. Action is being coordinated across business and government through Innovate Finance; and the UK Government (UK Trade & Investment) has set a clear focus on increasing the export of financial service technologies and attracting more foreign investment into the sector. This includes attracting foreign VC's like IIPL from Singapore, China Equity from China and others.
- **The FinTech community is brought together by the physical hub Level 39** at Canary Wharf providing co-working space for early-stage FinTech businesses and hosting innovation and accelerator programmes.
- **The FinTech community also benefits from numerous initiatives for early stage FinTech start-ups** such as FinTech Week, New Finance as well as several specialized FinTech accelerator programmes – many of them launched by financial institutions actively seeking to engage with start-ups; e.g. Barclays Accelerator, FinTech Innovation Lab, Lloyds Banking Group, Santander Innoventures, HSBS and more.
- **London's leading FinTech start-ups** includes TransferWise, Nutmeg, Currency Cloud, Funding Circle, MarketInvoice, Azimo, WorldRemit and eToro

Selected support initiatives | Project Innovative

Project Innovate is a particular interesting initiative helping financial businesses to navigate the regulatory landscape

The regulation body – FCA – is an active player in discussing compliance and possible new regulation with start-ups and established players. In 2014 FCA launched Project Innovate, an initiative that is designed to help both start-ups and established businesses to bring innovative ideas into financial services markets.

In order to learn about specific rules and policies that were restricting innovation or that should be introduced to facilitate innovation in digital and mobile solutions, FCA published a call for input on Project Innovate. FCA received feedback directly through six roundtables organised for three different groups of participants: small innovators, non-regulated businesses and existing regulated firms.

In each session participants was asked 1) to define innovation, 2) to tell about challenges that the regulatory system imposes on innovators, and 3) to give their feedback on the proposed Innovation Hub and Incubator functions.

Some of the main points in defining innovation were:

- Innovation solves a customer need; innovation is creating value through change; innovation is challenging the idea that 'this is how it's always done'.

- Innovation can either be disruptive or incremental; the latter type is more common but the former can be more valuable. Project Innovate should include both types of innovation in its scope.
- The FCA should consider innovation in business models and processes as well as technological innovation.
- It is important to ensure that the innovation has a positive effect on consumers, which may not always be the case.

Some of the main points in defining challenges and experiences were:

- Regulations are complex and costly to understand, leading to a significant drain on resources for innovators in financial services and creating uncertainty for investors.
- Start-ups would like more of an opportunity to informally discuss possible issues with the FCA before submitting the formal application to become authorized.
- Awareness of the FCA and what it does is very low for start-ups and technology businesses not focused on financial services.
- It is difficult for regulated and non-regulated businesses to receive feedback from the regulator on an innovative product or service before launch. This encourages a risk-averse approach, which stifles innovation.
- Innovator businesses sometimes find it hard to obtain a bank account. This appears to be a result of banks' concerns following fines received for breaches of anti-money laundering rules.

Some of the main input in designing an Incubator and Innovation Hub were:

- The website should be streamlined and improved - for example, to make it easier for start-ups to understand how to get authorized.
- The FCA should organize drop-in sessions to allow innovators to engage directly with the regulator. The FCA should also host surgeries and workshops on common themes and issues relevant to innovation in financial services.
- For innovators (both regulated and non-regulated), the FCA should provide more clarity on whether an innovative product

With these input Project Innovate was launched in October 2013 and has so far over 100 innovative businesses has received help, and over a dozen have now applied for FCA authorization.

Project Innovate plans to launch additional initiatives to enhance the pro-competitive impact such as a regulatory sandbox, themed weeks and engagement in RegTech.

Tel Aviv | General framework and conditions

Despite being a relatively young country, Israel has been able to build a strong high technology industry. The combination of their history, their culture, and through their investment in research and development, Israel has become a very innovative and entrepreneurial country.

Israel is a diverse, vibrant, and flourishing high-tech country in the middle of a politically unstable region. Israel has been coined “Start-up Nation” with the largest number of start-ups per capita. High technology is one of the country’s leading export sectors and accounts for about half of all its exports. The Israeli government has for more than 20 years, prioritized the high technology sector in its economic development. The nation is particularly strong in cyber and information security, finance, mobile innovation, storage and big data, trading and IT services.

- **What sets Israel apart** is that Israelis are brought up in a very entrepreneurial environment. As Israel is a country with a turbulent history and is constantly in a mode of survival, this mentality feeds very much into innovation and entrepreneurship and is embedded into the culture of the country.
- **The high tech sector is flourishing in Israel because** of many entrepreneurs’ background with the army. Many entrepreneurs come out of the army’s intelligence unit. At the ages of 18 and 19, many young men and women have gained experience in intelligence and in analytics. A lot of their work in the military is in data analytics or big data analytics, and in developing new technology for the army. By the time these young people have completed their time in the army’s intelligence unit, they are 20 or 21 years old and have gained experience in developing new innovation.
- **Israel is one of the world’s most technologically advanced countries** because of the government’s sponsorship and investment in the development of science and technology. Today, Israel has the most scientists and engineers in the world per capita, at 140 per 10,000 employees. This can be compared with the United States at 85 per 10,000 and Japan at 83.
- **Due to its small size, companies and start-ups in Israel have a very international focus.** The market in Israel is small and many start-ups and companies have international ambitions because there are larger and more lucrative markets beyond its borders. Along the same lines, Israel’s economic prosperity is in large part, due to its exports. Exports make up 40% of Israeli GDP. The country’s unique characteristics and established ecosystem for developing the high tech industry has accelerated Israel’s growth in this field and solidified their status as the “Start-up Nation”.

“Israelis are brought up in an entrepreneurship environment. The mentality of Israelis is very different from other countries, for good and for bad. Israelis tend to think that they know everything and know how to solve problems. As they are a country with a lot of problems and is always in survival, their mentality feeds very much into innovation and entrepreneurship. This mentality is very much embedded into the culture of the country”

Yael Waisbourd - Sucary, Fintech Program Manager at Bank Hapoalim

The Tel Aviv Fintech scene | Zooming In

The FinTech scene is well-established in Tel Aviv today. The development and growth of Tel Aviv's FinTech ecosystem has been supported by different actors including local Israeli and international banks, the government, the already established high tech scene in the country, and the ability of Israel to attract international companies and investments.

As Tel Aviv is the business, financial and commercial hub of Israel's economy, the city has been recognized as Israel's FinTech hub. The Israeli government has also supported the development of the FinTech sector and prioritizes it as one of its goals. The state provides incentives to international financial institutions to bring their offices to Israel. Today, Tel Aviv is home to many of Israel's banks including Bank Hapoalim and Bank Leumi, as well as being home to many multinational companies and their R&D centres, including Google, eBay, Facebook, Microsoft, Barclays, Citibank, and SAP for example.

The Tel Aviv FinTech Scene

- **Over 400** FinTech startups in Israel today
- **67%** of seed stage FinTech startups are located in Tel Aviv

Local Israeli banks are early adopters of FinTech products and testing for start-ups in Tel Aviv often start in the local banks. Banks are looking for new technological solutions and companies want to provide them. Bank Hapoalim in Tel Aviv has started a strategic collaboration with Poalim Capital Markets' technology division and launched a FinTech program to create this type of connection between the bank and start-ups. The bank benefits because they are exposed to new innovation and can offer new technologies that are of value to its customers, while the start-up companies also benefit as they are able to access an important platform for developing their product and their company before breaking into the international market.

Israel's economy is driven by different sectors within the high technology industry and the development of Tel Aviv as a FinTech hub has occurred quite naturally. Israel is strong in many areas including cyber security, big data analytics, and customer experience, and the knowledge from those sectors are also very relevant, transferable, and applicable to the FinTech sector. Although Tel Aviv is recognized as a FinTech hub, it is difficult not to include the rest of Israel as the country is quite small in size. Israel is a small country and a lot of different expertise is located outside of Tel Aviv in other parts of the country as well. There are approximately 400 companies in the FinTech ecosystem today.

It is also important to note that Israel's high tech scene is quite mature. Since the industry began in the 1980's, there is a segment of highly experienced individuals and companies in high tech who have knowledge of managing companies and taking those companies to IPOs and mergers. This group of has expertise in building large companies and they are often involved in the FinTech community as private investors, mentors, or sit on Boards. There is a generation of mature high tech experts who shares their experience with the younger generation and this collaboration also contributes to Tel Aviv's FinTech scene.

Tel Aviv FinTech start-ups are particularly successful in several areas and stem from Israeli culture and the high tech industry. These include innovations in payments, anti-fraud and security, and big data analytics.

Initiatives and support strengthening the Fintech ecosystem

The FinTech ecosystem in Tel Aviv is supported by numerous actors including the government, national and international banks, the venture capital community, academia, accelerators and incubator programs, FinTech companies and international organizations.

- **The government is a strong supporter of research and development in Israel**, investing 4.7% of its annual GDP in this area²². The government, through the Office of the Chief Scientist of the Ministry of Industry, Trade, and Labour, administers an incubator program and provides funds and other support programs for start-ups.
- **There are a number of FinTech accelerators and incubators located in Tel Aviv** and the city has been able to attract the attention of global international financial institutions. New York based Citibank opened its accelerator in 2013 and British bank Barclays together with Techstars, has also recently established an accelerator in the city.
- **Other initiatives, such as meet up and networking events** with keynote speakers hosted by different companies and organizations are a part of the FinTech scene in Tel Aviv. All of these different ways of meeting up and sharing experiences has supported the FinTech industry in Tel Aviv. Events include BankInnovation Israel, Startupbootcamp FinTech Tel Aviv, and FinTech Aviv Meetup events launched by CurrencyTransfer.com.
- **Dedicated work spaces for start-up companies** have also been established in Tel Aviv. There are a number of co-working spaces available for entrepreneurs in Tel Aviv. These work spaces have a very unique atmosphere and creates a buzz amongst those working there. Office and co-working spaces in Tel Aviv include TechLoft, WeWork, The Library Tel Aviv, Mindspace and Atidim 7 to name a few.

Selected support initiatives | Innovation Lab and Fintech Initiative

Citi's Innovation Lab TLV was established in Tel Aviv because of Citi's established position in the global financial market as well as Israel's well-known innovative and entrepreneurial culture. The lab is also supported by the Israeli Ministry of Finance and the Chief Scientist.

The lab employs over 60 people and their main objective is to understand and define new needs and opportunities in the financial sector and provide new cutting edge tools for the financial market. At Innovation Lab, they currently focus their work within mobile, security, risk engines, data intelligence and automatic trading within the FinTech sector.

In 2013, Citi launched its Citi Accelerator program designed to help grow young FinTech start-ups and help them achieve key milestones. The accelerator program focuses on developing companies that understand the need of global financial institutions and the financial industries market. Today, the accelerator is a part of Citi Innovation Lab TLV. The accelerator regularly hosts meet-ups and invites financial and business leaders to come together.

Fintech Initiative – Led by Bank Hapoalim's Information Technology Division, the office of Strategic Management at Bank Hapoalim and Poalim Capital Markets is a strategic corporate venture capital platform that targets promising FinTech start-ups that will collaborate with different divisions of Bank Hapoalim throughout

²² <http://www.tel-aviv.gov.il/eng/Business/Pages/StartupCityTelAviv.aspx?tm=2&sm=39>

the program. The goal of the program is to advance innovation in the financial services sector, develop new products and services for Bank Hapoalim's customers, and support the growth of the Israeli FinTech industry.

Early stage FinTech companies are assessed for their fit with the bank and their potential to further the banks' core businesses. In return, the start-ups are offered a design partner relationship that allows these new companies to test and develop their products with the support of a major financial player.

Poalim Capital Markets works with other venture capital funds and assesses the potential financial investment for leading start-ups in the Fintech Initiative program with Bank Hapoalim.

Singapore | General framework and conditions

The Singapore scene holds one of the most conducive pro-business environments due to extensive government support, a strategic favourable location and sizable capital.

Singapore is a cosmopolitan and culturally diverse nation home to 5.5 million residents, of whom around 70% are residents. Due to a small home market the city-nation's economy is highly dependent on export. Thus, the government has fostered what is recognised as one of the world's most conducive pro-business environment characterized by well-established business infrastructure, a concessional tax system with no capital gain tax, sizable foreign investments, trade linkages within the Asian market and strategic location in the heart of Southeast Asia. Singapore's deep and highly skilled workforce is fuelled by a pipeline of talent from an excellent educational system and an influx of international talent drawn the city facilitated by an open immigration policy designed to attract entrepreneurs and working professionals from around the world.

Singapore has emerged as one of the best places to live in Asia with a very high quality of life due to factors such as a stable political and social environment, a competitive, corruption-free, open business environment, world-class health infrastructure and internationally renowned educational system as well as higher GDP a per capita than that of most developed countries.

- **The city-nation's mature IT infrastructure, digitalization and strategic location has positioned Singapore as Southeast Asia's leading high-tech hub.**

Many leading US and European companies such as LinkedIn, Facebook, Twitter and Google have opened their Asian Pacific headquarters in Singapore.

- **The last five years the Singapore's start-up ecosystem has matured due to extensive government support** (promotion, grants, co-investment schemes) a growing number of academic entrepreneurship programs, (corporate) accelerators and increased access to funding as well as the start-up cluster JTC LaunchPad.

Singapore has been awarded the World Bank as the "Easiest place to do business" for 10 consecutive years

"It takes an entrepreneur just 6 working days to get a new business going in Singapore, with low start-up costs. Overall, taking into account other factors, including business, World Bank licensing, taxes, credit legal rights and investor protection, Singapore has about the most business-friendly regulation in the world.", World Bank Report 2010

In the last 10 years, 42 Singapore-based startups have been acquired for USD 529.3 million. The average exit was USD 40.7 million.

The Singapore Fintech Scene| Zooming In

The Singapore FinTech ecosystem benefits from conducive framework conditions and extensive government support fuelling stakeholder engagement.

Singapore's strategic location, advantageous cultural, legal factors and developed financial services sector and ICT capabilities provide fertile framework conditions for a thriving FinTech ecosystem. The last couple of years the Singapore FinTech scene has further been push-started by an ambitious government working to facilitate dialogue with the industry, providing incentive schemes, grants and extensive promotion as well as fostering flagship training and research centres; among these INSEAD, Singapore Management University-BNP Paribas Hedge Fund Centre, EDHEC- Risk Institute.

Initiatives and support strengthening the FinTech ecosystem

Entailed by an ambitious public strategy Singapore has experienced a booming FinTech scene powered by resources from financial corporates, venture capital firms, start-up events and communities bringing the ecosystem together.

- **Singapore's conducive environment has ensued Citigroup, Accenture and HSBC launching FinTech innovation labs and attracted specialised FinTech venture capital firms**, such as the former Moscow based fund Life.SREDA, Hatcher, Infocomm Investments and BlueHill Asset Management.
- **The last two years specialised FinTech incubators and accelerators has also entered the scene.** In 2013 Fatfish's subsidiary Fatfish Medialab launched its accelerator specialising in mobile, e-commerce and FinTech areas, and in 2015 further three specialised FinTech accelerators emerged:
 - The former Moscow-based FinTech venture capital firm Life.SREDA launched the FinTech accelerator InspirAsia.
 - Startupbootcamp FinTech also entered the market and has formed partnerships with Malaysias's RHB Banking Group and CIMB Group.
 - The Co-Foundry, a venture accelerator in Singapore and Plug and Play, a global accelerator based in Silicon Valley launched a TCF-PnP Program: Fintech Call 2015, bringing together the best of the start-up ecosystem and FinTech industry.
- **Some of numerous players strengthening the community** consist of the Singapore FinTech consortium mapping the entire ecosystem, the news site fintechnews.sg aggregating news and events and the site singapore-fintechstartups.com providing an overview of the FinTech start-up landscape by listing active players, stakeholders and events.
- **Singapore boasts numerous FinTech conferences and exhibitions** such as FinTech innovation Forum, The Crowdfunding Convention, Innovation for Financial Services and Next Bank Singapore.
- **Some of the most funded FinTech start-ups in Singapore** includes:
 - **Fastacash:** An online payment platform that allows users to send and receive money through a variety of apps. Total funding: US\$ 23.000.000

- **M-DAQ:** A trading service that makes cross-border securities trading more efficient by allowing investors to trade in any foreign currency denominated the local currency of their portfolio. Total funding: US\$ 17.500.000
- **TradeHero:** A stock market trading simulation that draws from real market data to provide a true-to-life experience. Total funding: US\$ 10.478.000
- **2C2P:** An online payments system enabling users to pay through online direct debit and providing businesses with payment methods. Total funding US\$ 10.000.000

Selected support initiatives | FinTech & Innovation Group

The Monetary Authority of Singapore has launched an interesting initiative strengthening the FinTech scene.

In 2015 the Monetary Authority of Singapore (MAS) launched a FinTech & Innovation Group (FTIG) within its organisation structure. FTIG is responsible for regulatory policies and development of strategies to facilitate the use of technology and innovation to better manage risks, enhance efficiency and strengthen competitiveness in the financial sector. FTIG comprises:

- Payments & Technology Solutions Office is responsible for formulating regulatory policies and developing strategies for simple, swift and secure payments and other technology solutions for financial services.
- Technology Infrastructure Office is responsible for regulatory policies and strategies for developing safe and efficient technology enabled infrastructures for the financial sector, in areas such as cloud computing, big data, and distributed ledgers.
- Technology Innovation Lab is responsible for scanning the horizon for cutting-edge technologies with potential application to the financial industry and work with the industry and relevant parties to test-bed innovative new solutions.

Ravi Menon, MAS Managing Director, said, “*Technology is transforming financial services, and innovation will increasingly be the source of competitive advantage in the industry. The formation of FTIG is a serious commitment by MAS towards our vision of a Smart Financial Centre, where technology is applied pervasively to create new opportunities and improve people’s lives. Sopnendu and his team will work closely with the financial industry and technology community to promote a culture of innovation in the industry while ensuring safety and security*”.

To support the strategy MAS launched in 2015 the Financial Sector Technology & Innovation scheme, SGD 225 million over the next five years, to develop FinTech and enhance the banking sector as well as encourage collaboration between finance and IT companies.

Amsterdam | General framework and conditions

The Amsterdam scene has a strong trade and commerce tradition due to its strategic location. The city's accessibility and market access as well as governmental support has fostered an international business environment with a thriving start-up and tech scene.

Amsterdam has a long history as a centre of culture and commerce from its beginnings as a 13th-century fishing village on a river bed to its current role as a cultural, commercial and financial European hub. The country's central-European location has provided an advantageous framework condition for trade and commerce. Today, the Netherlands is the sixth largest economy in the European Union and one of the world's ten leading exporting nations with more than 50% of their GDP deriving from international trade as well as one of the world's top recipients of foreign investment.

The city is home to 180 nationalities making it one of the most international cities in the world. Combined with a good educational system Amsterdam has access to a skilled, international-oriented and multilingual workforce with an English-language penetration bettered only by UK and Ireland.

Amsterdam's business friendly environment is characterised by fiscally friendly climate with a corporate tax rate below the European average, close collaboration and cooperation between the government, knowledge institutions and companies as well as conducive policy conditions for innovation and entrepreneurship. As an example the government has invested resources in an innovation strategy with projects like the Smart City initiative, where one can test out new products in a "living lab" and make tweaks based on real-world feedback.

The Amsterdam Metropolitan Area sits at its centre so-called 'Blue Banana', extending from northwest England in the north down to Milan in the south, and covering one of the world's highest concentrations of people, money and industry. This provides Amsterdam with easy access to Europe's approximately 530 million potential customers.

- **Amsterdam holds one of the most prominent start-up scenes in Europe** powered by the physical workspaces Spaces, B.Amsterdam and Rockstart Spaces, where start-ups can meet, cluster and collaborate as well as the bodies StartupDelta and Startup Amsterdam connecting the start-up community. StartupJuncture, DutchBasecamp and Silicon Canals are additional examples of foundations established by entrepreneurs providing a useful information for young start-ups.

- **The Netherlands also has a renowned tech scene** powered by a mature digital infrastructure with one of the fastest average broadband speeds in the world (Akamai's State of the Internet Report 2013) and one of the highest rankings of broadband penetration in Europe (OECD). This is further supported by the Global Competitiveness Report 2014-2015 by WEF; which credits Amsterdam for a strong adoption of technology as well as an excellent innovation capacity. The city also holds the presence of established players of the global tech scene, such as The Next Web as well as Netflix and Uber, which recently decided to establish their European headquarters in Amsterdam.
- **Academia is actively supporting the science- and tech startup scene** by initiating cross-institutional incubators such as ACE Venture Lab and YESDelft! Rockstart and Startupbootcamp are additional examples of renowned accelerators that are supporting the growth of start-ups in Amsterdam.

"We have a huge labour pool coming to Amsterdam, because it's a beautiful city that's still affordable"

Bas Beekman, the program director at Startup Amsterdam

Facts & figures about the financial and business services industry in the Amsterdam Metropolitan Area

- Largest cluster
- 20% of the regional economy (gross domestic product of the region)
- 40,000 national and international companies
- 50 branches of foreign banks
- 200,000 jobs
- 15% of the employment market

The Netherlands houses

- 125 banks
- 270 life and non-life insurance companies
- 450 pension funds Assets under management
- Dutch banks: €2.5 trillion
- Dutch pension fund industry: €800 billion
- Dutch insurance companies: €350 billion
- Dutch investment funds: €500 billion
- Dutch private equity industry

The Amsterdam Fintech Scene | Zooming In

Amsterdam's Fintech ecosystem is still relatively nascent but benefits from the city's tradition within financial innovation, a strong tech scene, the governments strategic engagement in the startup scene ensuing attention from private players.

Amsterdam has a strong and solid background within the financial service sector and as a financial innovator. The city spawned the world's first central bank, was the site of the world's first stock exchange and provided one of the earliest examples of a company pension scheme. Today the area is one of the world's largest market-making centres with firms like IMC, All Options and Optiver, a major asset management centre and houses several Dutch financial institutions such as Rabobank, ING, ABN AMRO and Delta Lloyd as well as one of the world's largest pension funds, the APG.

Initiatives and support strengthening the FinTech ecosystem

Amsterdam's Fintech ecosystem is founded on a strong established financial sector and a policy system fostering innovation. In the last couples of years these framework conditions have given rise to a budding FinTech scene.

- **Several financial institutions have initiated partnerships with Fintech start-ups;** In 2014, Rabobank launched its FinTech Hackaton and ING launched its accelerator program, FinTech Village, in collaboration with Deloitte, SWIFT Inn tribe, Belcube, SmartFin Capital, Eggsplare and Startups.be.
- **Amsterdam has attracted specialised FinTech investment firms** as Orange Growth Capital (OCG). The firm was founded in 2013 and has since then invested in, among others, the Dutch FinTech start-ups Bux and Komparu.
- **The Amsterdam FinTech scene is also powered by a physical centre for the start-up scene as well as different communities:**
 - B.Amsterdam, stands as one of the physical and spiritual centres of the Amsterdam start-up scene providing space, toolset and social environment.
 - The Next Web, one of the world's largest international media platform focusing at technology, culture and business, held its first conference in Amsterdam in 2006. The annual event has accelerated the global attention of the Amsterdam start-up eco-system.
 - European FinTech Awards is another example of a community connecting FinTech entrepreneurs, investors and corporates.
 - Holland Fintech was launched in 2014 to specifically strengthen the FinTech ecosystem by creating a community connecting established financial institutions, FinTech companies, government and regulators.
- **Some of the rising Amsterdam FinTech start-ups** includes Adyen, Acceptmail, Five degrees, Bux, Bitonic, Sparkholder, Symbid and Komparu. Other successful FinTech start-ups have also found way to the Amsterdam FinTech scene; e.g. BitPay has opened their headquarter in Amsterdam and Ethereum has some of their core developers in the Netherlands.

Selected support initiatives | StartupDelta

StartupDelta is a particularly interesting initiative connecting the entrepreneurial eco-system across the country horizontally and vertically.

Minister of Economic Affairs Henk Kamp, Neelie Kroes, Special Envoy for start-ups, and Harry van Dorenmalen, General Manager of IBM Netherlands, has launched the portal StartupDelta.org – a flagship and helpdesk for start-ups. The StartupDelta initiative consists of a team with connections in enterprise, government, research and all aspects of the start-up community. They are assigned to tackle challenges that hinder growth for start-ups.

The digital platform offer an insight into the entire start-up ecosystem of the Netherlands, provide start-ups with a complete overview of potential investors, and give support, fiscal information and an overview of financial regulations.

Over 1,000 Dutch start-ups and technology companies are represented on the StartupDelta.org platform. Thus, the companies can easily connect with one another, with potential investors and with specialised mentors. Another advantage is that start-ups can see what regional start-up hubs such as Eindhoven, Enschede, Groningen, The Hague or Amsterdam have to offer in the way of specialised programmes, specialisations, technology, or propositions as testbeds and launch pads for start-ups and scale ups.

Stockholm | General framework conditions

In Sweden, FinTech and FinTech related sectors play an important role in the Economy and is a driver of growth. Stockholm is the Swedish centre of FinTech and the sector is an important driver for city.

Sweden has for a long time been a European leader when it comes to digitalization and innovation, which was underlined by World Economic Forum in a report from 2011 where Sweden was described as “The most digitally connected economy in the world²³”. Sweden traditionally has had a strong focus on high-tech in general and telecommunication in particular and today the country has one of the highest numbers of jobs in the high-tech/ STEM²⁴ in the world.

“Sweden has a history in telecoms; thinking about transactions/interactions with the help of technology. This is deep-rooted in Sweden.”

Robin Teigland, Associated professor, Stockholm School of Economics

Stockholm stands for one third of the Swedish economy and is “growth engine” for the rest of the country²⁵. Stockholm is the Swedish centre of innovation, start-ups and digitalization and are benefitting from a strong entrepreneurial tradition. Stockholm has more multinational companies than any other Scandinavian city and Ericsson, Electrolux, H&M and IKEA all has headquarter in Stockholm just to name a few. Stockholm contributes with 31 % of Sweden’s business sectors GDP and is even more dominant in the Financial Sector where 66 % of Sweden’s GDP comes from Stockholm and 55 % of the employment in the Financial sector in Sweden (50.000 employees) are employed in Stockholm²⁶.

- **Today, Stockholm is today the ninth largest financial centre in Europe** and the leading financial centre in the Nordic Countries. The financial companies in Stockholm can be divided into three groups: Financial Services (including banks, investment and leasing), Pension & Insurance (Pension funds, insurance, reinsurance) and Supporting Services to the financial sector (FinTech, securities trading, brokers). The Financial services group is the largest group amongst the three measured in volume with 67 % of the market followed by Pension & Insurance with 27 % and Supporting Services to the financial sector with 6 %²⁷.
- **One of the reasons for Stockholm’s tech success is the city’s ability to create billion dollars companies.** Since 2003 Stockholm has been the number one in Europe when it comes creating billion dollars tech-companies and number three in the world behind Silicon Valley and Beijing²⁸ The start-up boom in Stockholm has

²³ <http://www.wired.co.uk/magazine/archive/2011/09/european-startups/stockholm>

²⁴ STEM stands for occupations in Science, Technology, Engineering and Math in non-high tech industries.

²⁵ ”Tillväkst Stockholm - Det finansiella ekosystemet som tillväxtmotor”, Stockholms Handelskammare & Nasdaq (McKinsey & Company 2014).

²⁶ Source: SCB

²⁷ Tillväkst Stockholm - Det finansiella ekosystemet som tillväxtmotor”, Stockholms Handelskammare & Nasdaq (McKinsey & Company 2014).

²⁸ <http://www.zdnet.com/article/stockholm-is-the-most-prolific-billion-dollar-startup-hub-behind-silicon-valley/> Since 2003 stockholm has created five billion dollars companies: Mojang, Klarna, King Dig- ital Entertainment, Spotify, and Skype

been driven by a good Start-up infrastructure and an start-up environment with a lot of entrepreneurs with successful exits backing up, inspiring and mentoring the next generation of start-ups.

The Stockholm Fintech Scene | Zooming In

The FinTech ecosystem in Stockholm is built on a long tradition in FinTech that dates back to the early 1980's and benefits from a strong network and farsighted initiatives made to stimulate the sector in general and start-ups in particular. The Stockholm Fintech sector is continuing to grow explosively and is underlining Stockholm as a Fintech hub.

The FinTech sector in Stockholm have gained a considerable size and is still growing. Although the employment in Financial & Insurance on average is declining in Sweden (figure 1) FinTech in Stockholm is experiencing growth in the employment figures. The FinTech sector in Stockholm has seen an increase in employment in the industry and is thereby from 2010 to 2013 the employment within the FinTech sector increased by 44 %. In 2014, there were about 4.600 employees in FinTech companies in Stockholm²⁹.

The 2013 Stockholm FinTech sector had a revenue which was estimated at 1, 3 billion \$, which is an increase in revenue compared to the 2010 revenue of 25 %. "Trading & Banking technology" and "Payments" companies are the dominant areas in Stockholm's FinTech sector. In 2013, "Trading & Banking technology" companies stood for 38, 8 % of the total FinTech revenue in the Stockholm area while "Payments" stood for 33 % of the total revenue³⁰.

The success of the Fintech sector in the Stockholm region can be explained by different factors in and around the Stockholm FinTech eco-system and not only by a few standalone initiatives. The Stockholm FinTech sector is built on a strong technology and telecom tradition where Sweden as a geographically large country early developed an interest in tech and especially telecommunication that could help connect its citizens despite the long distances.

The history of FinTech in Stockholm began in the 1980s where the first wave of FinTech companies came to Stockholm partly kick-started by Swedish deregulation. In the beginning of the 1980s the Swedish government completed several deregulating initiatives including the removal of liquidity ratios for banks (1983), the lifting of interest ceilings (1985), and the lifting of lending ceilings for banks and placement requirements for insurance companies (1985). The Swedish deregulation led to the creation of a new group of companies, which would turn out to be very successful.

In 1984 the company the Optionsmäklarna (OM) was established and the company would become the first ever to provide a remote trading to the customers and one of the first electronic exchanges in the world. OM was the first of many Stockholm companies specializing in software for electronic trading including the companies Cinnober and Front. "The trading & Banking" technology area is still one of the keystones of Stockholm FinTech.

²⁹ "Stockholm FinTech : An overview of the FinTech sector in the greater Stockholm Region", Nicholas Wesley-James, Claire Ingram, Carl Källstrand, Robin Teigland, Stockholm School of Economics (2015)

³⁰ "Stockholm FinTech : An overview of the FinTech sector in the greater Stockholm Region", Nicholas Wesley-James, Claire Ingram, Carl Källstrand, Robin Teigland, Stockholm School of Economics (2015). P. 22.

The second FinTech wave came with the Internet and smartphone penetration. The Stockholm FinTech companies were able to build on the great Swedish Skills with IT and telecom and establish a range of interesting companies within the “Payment” solutions area. Companies like Klarna, iZettle and Payex are now an important part of the Stockholm FinTech hub and stands for a third of the revenue in the Stockholm FinTech sector.

“You have all the actors of any ecosystem: government, regulators, academics, big and small banks, venture capitals etc.... What is different about Stockholm is that it is so dense, that it is all in downtown Stockholm”

Robin Teigland, Associated professor, Stockholm School of Economics

Furthermore, the Stockholm FinTech sector has been helped by a fact that almost the entire Stockholm FinTech hub is located within a very short distance in downtown Stockholm. The short distances have been a part of the creation of an informal environment and a lot of networking activity in the same way as seen in Silicon Valley. There is a massive transfer of knowledge in relation to both formal and informal meetings and events taking place in Stockholm within the sector it selves and to other groups such as public decision makers.

Stockholm FinTech start-ups have been good at attracting capital. Over the last five years Stockholm has received 18, 3 % of the total volume of FinTech Investments in Europe and over the last 11 years 15, 9 %. In 2014, investments in 15 Stockholm based FinTech companies were 266 million dollars or 17, 9 % of the total amount invested in FinTech start-ups across Europe in 2014. Only London and Amsterdam had a larger investment volume than Stockholm in 2014. The success of attracting capital is properly helped by the fact that Stockholm FinTech has had its share of successful exits. From 2010 to 2014 Stockholm FinTech companies made exits at a value of US \$ 381 million. An important aspect of the Stockholm FinTech scene is the presence of role models. The many successful companies and exits serve as inspiration for the next generation of FinTech companies. Furthermore, the many successful entrepreneurs are a resource in the Fintech hub as mentors and partners.

“Stockholm is outperforming.... In 2014, Stockholm attracted more than Germany, Austria and Switzerland combined. In London there are certainly quite a few things happening in FinTech with good companies, however Stockholm is outperforming considering the size of London as a city and its financial sector.”

Torbjörn Bengtsson, Stockholm Business Region

Initiatives and support strengthening the FinTech ecosystem

FinTech in Stockholm has been helped by different initiatives and support that have strengthening FinTech:

- **Universities provide talent:** The Stockholm universities are a very important part of the FinTech ecosystem as a provider of knowledge and talent. Especially Stockholm School of Economics (SSE) and The Royal Institute of Technology (KTH) deliver a lot of talent to the local FinTech companies and organizations. Furthermore, the educational institutions are important for the ecosystem since the Swedish educational system attracts many skilled foreign students.
- **The Stockholm School of Economics Business Lab:** is considered to be one of the best business labs in Europe. The incubator was founded in 2001 and offers its services to SSE students, employees and researchers with business ideas. Since the beginning 90 start-ups has been to SSE Business Lab and the average SSE Business Lab had six employees and a turnover of nine million SEK. The SSE incubator has been a great help to the FinTech hub as well and the most successful company to ever to come out of SSE Business Lab is the Stockholm FinTech company Kreditor Europe AB, which is now called Klarna AB and had a net sales of 233 million EURO in 2014.

- **Start-up loans:** The public Swedish institutions ALMI and Vinnova supports start-up companies through Start-up loans, which supports a lot of Swedish start-ups not least in relation to FinTech.
- **The Founders Poker Game:** “The Founders” poker game four times a year is the typical example of the networking initiatives that strengthen the network between entrepreneurs and between entrepreneurs and VC’s and is so typical for tech and FinTech in Stockholm.
- **Immigration laws:** In 2008 the Swedish immigration laws were done more relaxed in connection to skills professionals especially in relation to computer professionals. The laws have done it possible for the foreign professionals to receive a 25 % income tax reduction and social security contributions in the first three years that they are in Sweden. These laws have made it for attractive for foreign labour to come to Sweden.

Selected support initiatives | STING

STING is an early stage incubator and accelerator, which indorse business development and networking within four themes; digital, health, cleantech and FinTech. The programme has been a strong support to the FinTech start-up scene.

The STING programme has been a great support to the FinTech sector by supporting people who work in established bank to develop their own ideas. In the STING program the participants can receive training in business development and are mentored by successful FinTech and IT entrepreneurs. Furthermore, the participants in the programme receive access to a business angel network, a venture capital fund, a recruitment service, and an international network of investors, business contacts and experts. STING has its own investment company Propel Capital, which helps companies accepted to the programme financially in the first early stage.

STING stands for STockholm INnovation & Growth and was established in 2002 The initiative is a partnership between Stockholm Country Counsel, the Royal Institute of Technology, Almi Företagspartner that have been teaming up with a group of Sweden’s best companies as resource providers such as Swebank, Ericsson, IBM and PWC. STING works as a non-profit company and its activities are partly publicly financed by Vinnova, KTH and EIT ICT Labs and partly financed by private funding from partners and self-funding. Since the beginning in 2002 STING has provided business development supports to over 100 innovative start-ups.

STING support only Stockholm-based start-ups and it competition to get in to the programme is tuff - the programme screen between 150-200 projects annually and end up accepting 20 companies per year into the programs. Most of the accepted companies come from the industry while about 30 % come from universities and research institutions³¹.

Selected support initiatives | NFT Ventures

An important aspect of supporting the next generation of FinTech companies is to secure access to funding for companies on the way up. With NFT Ventures Stockholm has got its first venture Capital firm entirely focusing on the FinTech sector, which will support the sector and create awareness about the FinTech sector.

In 2014 Stockholm got its first Venture firm, which is specialized in FinTech. NFT Ventures is founded by partners with a lot of know-how about financial transactions and the FinTech ecosystem in general and the company is building on the assumption that many venture capital companies haven’t understood the sector properly³². By focussing entirely

³¹ <http://www.stockholminnovation.com/>

³² Founder Johan Lundberg in <http://swedishstartupspace.com/2015/09/30/nft-ventures-ups-the-tempo-in-the-race-to-find-the-next-klarna/>

on FinTech NFT Ventures hope to have an edge and that the knowledge will do well for the sector. The initial NFT Ventures fund was mainly financed with money from media conglomerate Bonnier

So far NFT Ventures have invested in 15 companies and it firm hopes to do five more investments this year and NFT Ventures hope to raise money for a second investment fund in order to invest in even more companies in 2016. The funding for the initial fund came primarily from media conglomerate Bonnier but NFT Ventures are looking for additional investors in round two.

The average investment in NFT Ventures funded FinTech companies will be in the area of 1.2 million \$ per company in return for an owners stake of around 25-30 %.

Helsinki | General framework and conditions

The Helsinki scene is characterized by strong start-up ecosystem. Helsinki is affected by massive lay-offs of Nokia and Microsoft, which acquired Nokia's mobile phone business. For that reason there is plenty of available talent in Helsinki region which have promoted both new start-ups and attracted global R&D investments in Helsinki. A good example of start-up boom is the Helsinki based game companies like Rovio and Supercell.

Helsinki has managed to maintain its attractiveness as one of the world mobile ICT hubs. In recent years companies like Intel, Huawei and Samsung have opened their R&D facilities in Helsinki in order to benefit from the regional talent in mobile telecommunication development. Helsinki have also enjoyed from start-up boom which most remarkable outcome was Supercell whose value exceed a billion euro when it was sold to Japanese Softbank. In general Finnish business system has shifted to more mature stage. Now it is more agreed that access to seed funding is not that big problem for early phase companies than it used to be since there is more angel funding and venture capital available. Even so, there are still problems for companies to get funding up to the large scale and for that reason it feared that promising start-ups are sold to fast.

- **The public supports remains strong:** At cities of Helsinki and the University of Helsinki have united their forces and they have introduced the co-creation base for entrepreneurially minded people – Helsinki Thing Company. City of Helsinki provides some other working space as well. This is relatively new phenomenon in Helsinki and in Finland. In funding the government role remains important. That funding is not targeted only Helsinki but Finland in general. The most important source of public funding is Tekes the Finnish Funding Agency for Innovation. That can provide up to one million euros for new innovative companies that have international potential.
- **Helsinki has attracting new type of companies:** International internet-retailers like German Zalando and Norwegian XXL are locating their ICT-development units to Helsinki. International venture capitalist are looking for Helsinki ICT-companies especially in game industry which is nowadays the most attractive branch of ICT industry in Finland.
- **Slush** is a new landmark of Helsinki start-up scene. It is a huge annual start-up festivals attracting more than 15 000 visitors from more than 100 countries. Slush has put Helsinki on the international start-up map and there is evidence that Slush has been attracting new companies to locate in Helsinki and the conference has been the place where international investors have found Helsinki based companies to invest in.
- **Accelerators and incubators:** There are both national and local accelerators and incubators in Helsinki. The backbone of Finnish national accelerators are the Vigo-accelerators. There are 10 different Vigo -programs for different type of companies – those are divided by the branch of the industry or target market. There is no specific program for Fintech but at least one of the ICT accelerators have know-how in that fields. There are also local incubators and accelerators in Helsinki region. AppsCampus is organized by Aalto-university and co-funded by Nokia and Microsoft. It promotes mobile start-up ecosystem and especially aim to create apps for Window phone. Spinnverse Innovation Mills supports industrial spin-offs. Spinno is incubators for high-tech – start –up and it supports companies from early phase business plan to internationalization. Startup Sauna provides five weeks accelerator programs for any company with international potential. Startup Sauna looks actively investors for start-ups. Founder Institute is one of the world biggest accelerators and it operates also in Helsinki. Verki is a private accelerator and it aims to network the companies. NewCo Factory is founded by the city of Helsinki to support start-up – teams. Makery is specialized to food industry. Start-up Center is Aalto Univeristy's accelerator. It also provides facilities for the companies. Startup Bootcamp is an accelerator program that last for three months. It brings together entrepreneurs and mentors.

The Helsinki Fintech Scene | Zooming In

The Helsinki FinTech ecosystem is strongly led by the banking sector. In 1990's Finnish banking sector was advanced in e-banking and mobile services. Nowadays the industry is rebounding thanks to start-up boom in Helsinki. The cluster has not organized so far and there is not specialized support program for that industry.

Helsinki is a national hub in financial services but it has not international role. Over last few decades the banks in the Nordic countries have merged and for that reason Finnish banking sector is becoming more subsidiary based. Besides Finnish OP-Pohjola, Nordea and Danske Bank are the major banks. That developments threatens to some extent ICT-development made by banking sectors in Helsinki.

The ICT-industry in Finland and Helsinki in general have affected strongly by the downturn of Finnish mobile phone industry. On positive side it has created a vibrant start-up culture and as part of it emerging FinTech – cluster.

The Helsinki FinTech – cluster is based really strongly on technical knowhow. The collaboration between the banking sector and start-ups are relatively weak so far. The interesting new opening is a private FinTech accelerator program organized by Nordea and Nestholma. Nordea is the biggest bank in Finland and Nestholma is a company specialized to facilitate collaboration between small and big companies.

The Helsinki FinTech cluster has a strong history in mobile services. The telecom companies introduced SMS based payment system already 1990's. In the same time the banking sector pioneered e-banking. In the mobile payment systems the development stopped partly because the SMS based system left the role of the lender to telecom companies which did not want to take that role. The development started again when the smart phone development enabled the possibility to use credit card in mobile apps. This time the same development is taking place globally and Helsinki based actors are not pioneering any more.

Besides mobile application Helsinki has strong competences in data analytics and cyber security. These fields of competences create a good potential for FinTech development in the future. It is significant to remember that FinTech in Helsinki is a rather young industry and most of the start-up activity has emerged in few last years.

Initiatives and support strengthening the FinTech ecosystem

There is hardly any initiatives that supports directly FinTech ecosystem. As ICT-companies they enjoy support from various supporting initiatives for ICT. Nordea's accelerator program with Nestholm is the only program targeted on FinTech – companies.

- **Nordea accelerator:** Nordea start-up accelerator program is a free, intensive three-month program in Helsinki, Finland run in collaboration with Nestholma Venture Accelerator. The program focuses on new, outside the box, innovations for *customer experience and touchpoints in digital, value opportunities around payments* and

The Helsinki FinTech Ecosystem

- Helsinki has approximately 40 start-ups in the field
- All major ICT-services providers, banks and telecom companies in Finland have headquarters in Helsinki
- The strength of Helsinki Fintech are mobile services especially mobile payments. The development is based on technological knowhow.
- Helsinki has more potential to foster collaboration between different sectors of FinTech like payments and cybersecurity

as well as *ways for achieving your dreams by savings and other means*. During the program start-ups get a unique opportunity to work with and learn from Nordea's experts and executives. Selected start-ups have an innovative service or technology solution with international growth potential.

- **Gorilla Ventures:** Gorilla Ventures is one of the national Vigo – accelerators. Is not targeted only FinTech but ICT in general. Gorilla Ventures has the best knowhow in FinTech companies. The target of the Gorilla Ventures is to combine both private and public funding in order to facilitate the rapid growth of the start-ups. Vigo programs are coordinated by the ministry of labour and economic but operatively they are run by private companies.

Selected support initiatives | Slush

Slush is the most interesting thing going on in Helsinki. It is a huge start-up event that bring together 15 000 entrepreneurs, investors and journalist interested in the topic.

Slush is a start-up event in Helsinki, which is internationally attractive. The event takes place every year in November. Slush has also created satellite events abroad like Slush Asia in Tokyo.

Slush is one of the biggest start-up and technology conference in Europe. There is evidence that it has brought growth capital investments in Finnish start-ups and it has been a reason why some hi-tech companies have located to Helsinki. For instance Zalando has mentioned start-up ecosystem and Slush one reason to choose Helsinki as their location.

Slush has various themes and they have recognized FinTech as a category of start-ups.

Oslo | General framework and conditions

The Oslo Scene is characterized by strong energy and the maritime sectors. Furthermore, Oslo also has a relatively strong ICT sector and mobile communication in particular.

Norway is located between the North Sea and the North Atlantic Ocean and contains a variety of natural resources such as petroleum, Natural Gas, Fish, Iron, copper, zinc lead, titanium, timber, and hydro power. Due to the richness of natural resources and location the Norwegian business sector is very strongly rooted in raw materials and Norway is the world's fifth largest exporter of oil and the third largest exporter of gas and the natural resources is the country's main income source³³. Furthermore, a close connection to the sea and very long cost line has made the maritime sector another very important sector for the Norwegian economy.

Beside the traditional strongholds of the Norwegian economy ICT is increasingly becoming an important sector for Norway. Norway has a strong interest in new technologies in general and mobile communication in particular and Norway is today a key driver when it comes to developing and adapting new services and products on the mobile market.

Oslo is the business centre in Norway. In 2003, Oslo contributed with 25 % of the Norwegian GDP and Oslo has the largest port in the country and is the Norwegian energy knowledge centre even though a lot of the Oil and gas activity is centred on Stavanger. Furthermore, Oslo is ICT epicentre of Norway and the location of the majority of the counties ICT companies/ mobile communications service providers such as Telenor, Opera software and Funcon.

- **Oslo ICT:** Oslo have a well-established ICT scene that has continued to growth regardless of the financial crises, which never really was able to affect either the Norwegian Business sector. In 2014, the Norwegian ICT sector counted 40.335 employees of whom 40%³⁴ was working from Oslo, which underlines the close link between Norwegian ICT and Oslo³⁵. ICT in Oslo is still growing and from 2008 to 2014 the Oslo ICT sector has grown with 14 %³⁶. In recent time some of the leading Norwegian ICT companies such as Nets and EVERY are beginning to bring attention to the FinTech area.
- **The Financial sector:** Oslo is the financial hub in Norway and the majority of the people employed in the Norwegian Financial sector are employed in Oslo³⁷. Oslo has registered 5.236 people as working under the industry code "Finans- forsikringshjelpetjenester" (Finance and insurance assistance Services), which is 66 % of the total employment within the industry code. It is lightly that a part of the employees in fintech sector represent a substantial share of the employment in this industry code. Even though the Oslo financial sector is not an international hub the sector is and will continue to be an important part of the Oslo FinTech ecosystem.

³³ <https://www.cia.gov/library/publications/the-world-factbook/geos/no.html>

³⁴ Source: <http://www.kommuneprofilen.no/Profil/Sysselsetting>

³⁵ Oslo metropolitan area has a population of 957.709 and Norway 5.165.802 (2013), which means that a little less than 19 % of the Norwegian Population lives in Oslo. Close to 40 % of the employees in the Norwegian ICT sector works in the Oslo metropolitan area.

³⁶ Oslo ICT employed 13.891 people in 2008 and had 15.991 employees in 2014. Source: <http://www.kommuneprofilen.no/Profil/Sysselsetting>

³⁷ The three main financial areas in Norway were "Finansieringsvirksomhet" (29.334 Employees in 2014 of which 10.337 was located in Oslo), "Forsikring og Pensjonskasser" (10.255 Employees in 2014 of which 4.769 was located in Oslo) and "Finans- forsikringshjelpetjenester" (7.981 Employees in 2014 of which 5.236 was located in Oslo) Source: <http://www.kommuneprofilen.no/Profil/Sysselsetting>

- **Oslo is a world-class ICT test centre:** Norway is an information society with a highly developed mobile market and great ICT skills, which has made Oslo to a very attractive test market for new ICT services and has made it possible for the city to attract world class companies such as Google Inc. and Microsoft.
- **Oslo's important ICT educational institutions:** Oslo has many ICT educational institutions for instance the region's largest educational institution for ICT the Department of Informatics at the University of Oslo. Other important educational institutions are SINTEF, and Norwegian Computing Centre
- **Maritime sector has a considerable size:** The maritime sector in Oslo employees around 8.600 employees divided into the more than 980 maritime companies in Oslo. The largest Norwegian port is the Port of Oslo where 6.000 ships dock a year bringing in 6 million Tons of cargo and more than five million passengers a year.
- **Oslo has a comprehensive Start-up ecosystem:** Oslo contains many good and interesting start-up initiatives that supports the start-up scene from idea, to establishing a start-up and all the way to the growth phase. If you have a **good idea** for a start-up you can test and develop the idea at LEAN start-up Norway, Meetup.com, Venture Cup, Start Norge and work at one of the offices that Oslo's start-up ecosystem provides such as Grundergarasjen, Bitraf, 657 Oslo, StartupLab or at Mesh cafe. If you have a **start-up** the Oslo ecosystem also provides a range of different supporting frames for you as well such as Appacademy, Build2Grow, PangStart, StartupSummer, MeshAfterwork or you can even go to Silicon Valley with TINC - TechINCubator. Funding is accessible through Alliance Spring Venture, Funders Fund and with Skattefunn you can apply for tax refund for entrepreneurs. If you are a company looking for growth the Oslo ecosystem also provides supporting initiatives to you a range of initiatives like Digital Winners and Silicon Viking and you can sit at OsloTech attract funding from Creandom, Investinor, Northzone Invest and Schibsted Vekst.
- **Innovasjon Norge:** Supports innovation in Norway from its main office in Oslo. Amongst other initiatives Innovasjon Norge offers start-up grants (etablerertilskudd) for up to 600.000 NKR to start-up companies.

The Oslo Fintech Scene| Zooming In

The Oslo FinTech scene and ecosystem is based on a relatively strong ICT sector and Oslo's role as the national bank hub and many start-up supporting initiatives. So far there has not been a structured Industry supporting strategy or program for the Oslo FinTech start-ups but new initiatives are on the way.

The Oslo FinTech Scene has a strong tradition for collaboration and a few large important such as Nets and EVRY that has help build up FinTech in Norway. An example of the collaboration between some of the main players in Norwegian FinTech is BankAxept, which was established in 1991 by the Norwegian banks³⁸. Today, all Norwegian banks offer credit cards with BankAxept and eight out of ten transactions performed by bank card in Norway are performed by a bank card with BankAxept.

The Oslo scene consists of a few large established players such as Nets, EVRY and DnB³⁹, which is involved in FinTech and adds some volume to the industry. Furthermore, a group of quite young and foresighted companies like Zwipe, mCASH and Sparbank1, who recently bought Mcash, have occurred on the scene and has made the future look promising for the Oslo FinTech scene.

FinTech in Oslo is very much connected to the more established sectors ICT and banking. A close collaboration between ICT, the financial sector and very strong public and private framework initiatives towards start-ups is a powerful cocktail and makes in interesting to follow FinTech in Oslo in the future.

Initiatives and support strengthening the FinTech ecosystem

There has been only a few dedicated initiatives in order to support the Oslo FinTech ecosystem but the Start-ups scene in Oslo is filled with good and promising initiatives that helps entrepreneurs in general. A few of the many start-up initiatives has involved banks and the FinTech orientated part of the ICT sector:

- **DnB Innovasjonspris:** DnB is Norway's largest Bank and has been organizing the DnB Innovasjonspris, which have been focusing on the value of knowledge-based growth in Norway. So far thousands of ideas have been in the competition and tested by a jury.

³⁸ Established as a collaboration between Sparebankere and Forretningsbankene

³⁹ For instance DnB has created the most popular money transfer app in Norway. So far the app has benn downloaded more than one million times.

The Oslo FinTech Ecosystem

- **Oslo** has some very strong ICT companies working in FinTech lead by Nets and EVRY and a group of very interesting start-ups in the field such as mCASH and Zwipe.
- **Most major ICT-companies and banks** in Norway have headquarters in Oslo.
- **The strongholds** of Oslo Fintech are payments and security.
- **Strong start-up framework conditions** and start-up supporting initiatives makes it easy for new FinTech start-ups to get started in Oslo.

- **Oslo Innovation Week:** Is a returning event ones a year which include more than 60 entrepreneurship events all over Oslo in a single week. As a part of the event in 2014 IKT Norge and Finans Norge arranged a Fintech seminar in order to promote the sector and create.

Selected support initiatives | FinTech-Forum

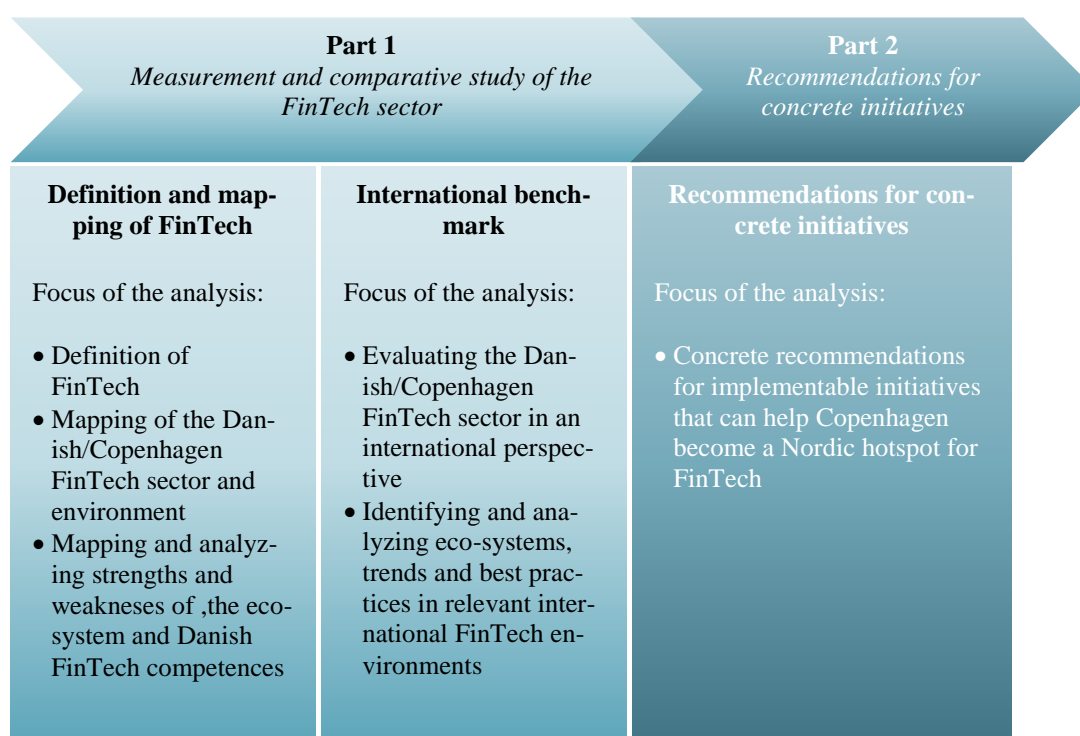
Build on the understanding that cooperation is a key component for success of Oslo FinTech a group of stakeholders has established a new FinTech Forum. The main initiative takers to the FinTech-Forum is IKT Norge who is a main interest group for the Norwegian ICT industry and Finance Norway who is the industry organisation for the financial industry in Norway. The main purpose of FinTech-Forum is to get ICT companies to interact and network with the financial sector and public authorities and thereby stimulate FinTech innovation, address regulatory challenges and get the media to bring FinTech higher on the agenda. FinTech-Forum wants to engage with the other Nordic countries and work engage in dialog with the other important Nordic FinTech organizations such as CFIR.

Since the FinTech-Forum was first initiated in 2014 the forum has arrange several seminars, been at conferences and held Lunch- and evening meetings in order to bring awareness to FinTech in Oslo.

8. Methodological and analytical approach

The analysis consists of two parts – 1. Measurement and comparative study of the FinTech sector and 2. Recommendations for concrete initiatives. Part 1 is the analytical part, where we have collected data and qualitative assessments of the Danish FinTech ecosystem and benchmarked it with other international FinTech hubs. In part 2 we have deduced the recommendations from the analysis, but also included and involved the key stakeholders of the Danish FinTech ecosystem in six workshops. Our analytical approach is illustrated in figure 8.1.

Figure 8.1. Analytical approach



Methodologically, the analysis is based on the following:

- **Desk research and literature review** of existing international articles and reports
- **27 qualitative interviews.** 9 interviews with national FinTech experts and stakeholders. 18 interviews with international FinTech experts and stakeholders.
- **Six workshops** with the stakeholders of the ecosystem – start-ups, investors, research and educational institutions, corporates, regulators and public authorities, accelerators and co-working spaces.
- **Two web based surveys.** One with Danish Fintech companies and one with international experts and stakeholders.
- **Eight case studies** on international FinTech hubs describing their ecosystems and strengths and weaknesses in relation to FinTech.

The use of different methodological approaches, both qualitative and quantitative, makes it possible to triangulate and thereby strengthen the validity of the findings⁴⁰. In this analysis, we have combined desk research, literature review, qualitative approaches (interviews and workshops) with a quantitative survey among FinTech companies in Denmark and international experts and stakeholders to ensure a cross verification of the findings from more sources.

8.1.1 Desk research and literature review

The analysis is based on thorough research and an extensive review of existing literature concerning FinTech. Since the field of FinTech differs from other sectors in a traditional sense and since it is still in its early stages in terms of a clear definition, the reviewing of literature on FinTech has provided insightful information on approaches to the definition and understanding of the sector, but also to gain an understanding of the growth potential and future development trends of the FinTech sector. The primary literature used for the study are listed below:

- StrategyEye (2014): *Insight Report: The Future of FinTech*
- Metia (2014): *FinTech Insight 2014 – Financial Technology trends and innovations from leading industry influencers*
- AWI, KPMG Australia and the Financial Services Council (FSC) (2014): *The 50 Best FinTech Innovators Report*
- Stockholm School of Economics (2015): *Stockholm FinTech - An overview of the FinTech sector in the greater Stockholm Region.*
- KPMG (2014): *Unlocking the potential: The Fintech opportunity for Sydney*
- Accenture (2014): *The boom in global fintech investment – A new growth opportunity for London*
- Accenture (2014): *The Future of Banking and Fintech*
- Silicon Valley Bank (2015): *Investment Trends in Fintech*
- Oxford Research (2012): *Global arbejdsdeling I den finansielle sektor*
- Oxford Research (2009): *København på det finansielle verdenskort*
- EY (2014): *Landscaping UK Fintech*
- InvestHK (2014): *The Rise of FinTech – Getting Hong Kong to lead the digital financial transition in APAC.*
- Techcrunch.com⁴¹
- Quora.com⁴²
- Whartonfintech.org⁴³

8.1.2 Defining fintech

The definition and understanding of FinTech is based on literature review of previous FinTech definitions (and its sub-sectors) and a feedback meeting with the CFIR-secretariat and the steering committee. At the meeting, the definition was presented following a discussion with the CFIR-secretariat and the steering committee.

In this study, FinTech is defined as:

‘Digital technologies and solutions that supports and enables financial services and activities’.

Our definition is not limited to ‘those that develop and offer technologies’ for the financial sector. In our view, FinTech should also include the buyers and applicants of technology in the financial service sector – the banks, insurance

⁴⁰ Greene, Jennifer C. (2007): *Mixed Methods in Social Inquiry*

⁴¹ <http://techcrunch.com/2015/07/21/fintechs-five-dark-horse-cities/>

⁴² <http://www.quora.com/What-are-the-biggest-FinTech-trends-in-2015>

⁴³ <http://www.whartonfintech.org/blog/what-is-fintech/>

agencies, pensions funds, mortgage lenders etc. In practice, the financial service providers are both important drivers of FinTech innovation and are also often deeply involved in the development and implementation of FinTech solutions.

Secondly, our definition emphasizes that FinTech is about digital technologies. We acknowledge that technologies such as money printing and hardware for payment solutions and cash withdrawal are not solely digital but also contains physical parts. However, we think it is important to stress that it is the digital technologies that this project has in focus. It is the digital technologies, which are changing the financial sector rapidly today and it is within the digital solutions and technologies that the growth potentials are.

Finally, we will stress that digital technologies that are not exclusively used in the financial sector, but which are crucial enablers in offering financial services, such as for example cybersecurity solutions, are also to be considered FinTech.

8.1.3 Mapping of the Danish FinTech sector

After reaching a consensus of the definition of FinTech, the next step was to map the FinTech companies in Copenhagen/Denmark. To map the sector, the project team operated with the following lists and data:

- CFIR's member list
- Finanssektorens Arbejdsgiverforening's (FANET) member list
- List of companies in the Danish Financial Supervisory Authority's (Finanstilsynet) database

We added more companies to the list by a thorough internet search, but the majority of the FinTech companies are from the abovementioned lists.

The key principle behind the mapping was to create a long list of potentially relevant FinTech-companies, and then narrow it down to the core companies of the FinTech-sector by critically examining each of the companies. As the initial step of the mapping, the project team received a long list of FinTech-companies from CFIR. In addition, the project team conducted a manual review of relevant companies in FANET's member list and the Danish Financial Supervisory Authority's (Finanstilsynet) database and added these to the long list. Parallel to these reviews, a thorough desk research and internet search on the companies were carried out to ensure the quality assurance of the mapping. Finally, a manual sorting of the list was made.

The complete list included 368 companies related to the FinTech sector and was sent to the CFIR-secretariat for verification. This list forms the basis for the survey.

8.1.4 Interviews with national and international FinTech experts and stakeholders

We have carried out 27 qualitative interviews with national and international FinTech experts and stakeholders. The interviews were carried out following a semi-structured approach. In total, nine interviews with relevant national experts and stakeholders were made.

Position	Name of interviewee	Organisation/company	Type
Professor and Director of HIPERFIT Research Center	Fritz Henglein	University of Copenhagen	Education and research
Professor of Department of IT Management	Jan Damsgaard	Copenhagen Business School	Education and research
Principal	Mads Tofte	IT University of Copenhagen	Education and research
Co-founder and CTO	Gert Sylvest	Tradeshift	Start-up

Founder and CEO	Kim Vindberg-Larsen	MeeWallet	Start-up
Investor	Morten Lund	GroupXO	Start-up
Investor	Mads Faurholdt-Jørgensen	Nova Founders Capital	Start-up
Head of Experimentation and Learning in Digital Banking	Jan Sirich	Nordea	Corporate
Industry Leader, Financial Services Sector	Henrik Koch	IBM	Corporate

Besides the national interviews, 18 telephone interviews with international experts and stakeholders were carried out. The interviews followed a semi-structured interview guide, but we used different approaches to each of the informants depending on their position and expertise.

City	Position	Name of interviewee	Organization/Company
Stockholm	Associate professor	Robin Teigland	Stockholm School of Economics
	Business Development Manager	Torbjörn Bengtsson	Stockholm Business Region
Helsinki	Head of New Business Development (Internal Accelerator Program)	Kristian Luoma	OP Financial Group
	Chief Digital Officer	Kai Koskela	Säästöpankki
	Chief Experience Officer	Mikko Teerenhovi	Holvi
	Senior Advisor	Toni Mattila	Invest in Finland
Oslo	COO	Anders Bakke	mCASH (start-up)
	Director	Liv Freihow	IKT-Norge
	Vice President	Christoffer O. Hernæs	Sparebank 1 Gruppen
Amsterdam	Selection and Alumni Partner	Marc Wessellink	Startupbootcamp Amsterdam
New York City	Managing Director	Jesse Podell	Startupbootcamp FinTech New York
London	Managing Director	Liz Lumley	Startupbootcamp FinTech London
	CEO and Co-founder	Nektarios Liolios	Startupbootcamp FinTech London
Tel Aviv	Digital Solutions Manager	Avi Cohen	UK Israel Tech Hub, British Embassy Israel
	Head of Co-Innovation Network Israel	Ben Gilad	Tata Consultancy Services
	CEO	Ori Faran	CallVu (start-up)
	Fintech Program Manager	Yael Waisbourd-Sucary	Bank Hapoalim
Singapore	Managing Director	Steven Tong	Startupbootcamp Singapore

8.1.5 Workshops with key stakeholders

A substantial part of the data collection was obtained by engaging the key stakeholders of the FinTech ecosystem - start-ups, investors, research and educational institutions, corporates, regulators and public authorities, accelerators and co-working spaces. The purpose of the workshops was to get their inputs about strengths and challenges of the FinTech ecosystem as well as to receive their ideas on recommendations for concrete actions. The workshops dealt with the following themes:

- 1. FinTech start-up workshop:** All start-ups were invited to participate in this workshop. In total, 21 persons participated in the workshop representing 16 different start-ups. The workshop focused on how Copenhagen can become a hotspot for FinTech.

2. **Investor workshop:** Workshop with a combination of angel investors and VC's, including Business Angels Copenhagen, CAPNOVA, Northcap on how they view FinTech in Denmark and how to create a leading ecosystem.
3. **Legislation and regulation workshop:** Workshop with legislative and regulative authorities. In total, 15 persons participated in the workshop having different regulatory and legislative roles such as the Danish Business Authority, the Danish Agency for Science, Technology and Innovation, the Municipality of Copenhagen, the Danish Chamber of Commerce etc. In the workshop, it was also discussed how we can create the right framework conditions for FinTech from a policy perspective.
4. **Academia workshop:** Workshop with the relevant research and educational institutions in FinTech. In total, four persons participated representing Copenhagen Business School, the University of Copenhagen and the Danish IT University.
5. **Corporates workshop:** Workshop with key players in the financial services sector. In total, 21 persons participated in the workshop from large corporates such as Tryg, Danske Bank, Google, PFA etc. In the workshop, the participants discussed their views and perspectives on innovation within FinTech.
6. **Co-working spaces and accelerator workshop:** Workshop with co-working spaces and accelerators for recommendations on how they can contribute to a better FinTech environment in Copenhagen. Five persons joined the workshop from Venture Cup, Creative Business Cup, Scion DTU, Alexandra Instituttet and Startupbootcamp.

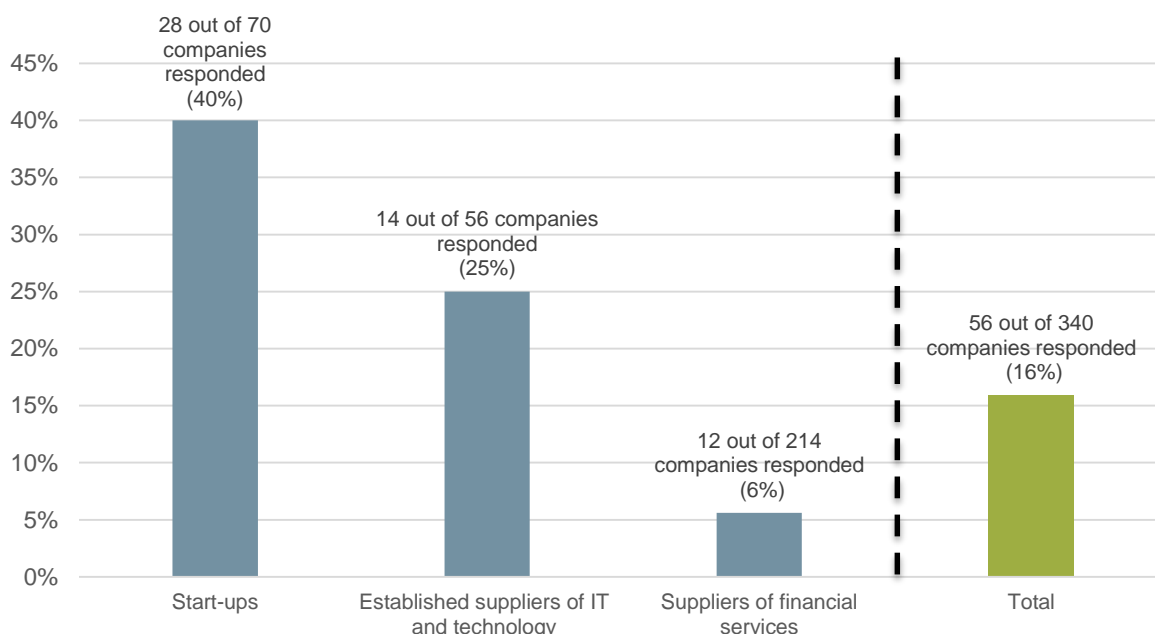
For all workshops, a thorough desk research was carried out to ensure that all relevant actors were invited. Four weeks prior to the workshops, the participants received an invitation and the agenda for the workshops that were all held at Rainmaking Loft in Copenhagen. Persons and organizations that were unable to attend were invited to give their inputs by telephone or e-mail.

8.1.6 Web-based survey with the Danish FinTech companies

The survey was set up in Enalyzer – an online platform for creating and distributing surveys. The survey was distributed to all companies of the list. 340 companies received an e-mail invitation to participate in the survey, while 28 companies were left out of the survey due to an invalid e-mail address. In order to get the most qualified assessments and answers in the survey, we used many resources on retrieving personal contacts (mainly for CEO's, CIO's, CTO's or partners) through CFIR and also by carrying out desk research. Where personal contacts could not be accessed, the company email was used instead. The following types of businesses received an e-mail invitation to participate in the survey:

- **Suppliers of financial services** (214 companies)
- **Start-ups** (70 companies)
- **Established suppliers of IT and technology** (56 companies)

In total, 54 companies participated in the survey, meaning a **total response rate of 16 %**. Out of the 54 participating companies, the responses divided by type of business is seen in figure 1.3.

Figure 8.2. Response rate by business type

Source: Oxford Research and RainmakingInnovation

As shown in the figure above, the response rate differs between the business types, and start-ups is the type of business that is the most likely to participate in the survey. ¼ of the established suppliers of IT and technology has also participated, which is a good response rate. However, the suppliers of financial services were generally reluctant to participate in the survey. An explanation for this might be that many of the suppliers of financial services are micro and small enterprises (0-49 employees) that feel less connected to the FinTech sector than start-ups and established suppliers of IT and technology.

Reminders were sent out to companies who had not completed the survey, and follow-up phone calls were made to companies who the project team identified as central FinTech-actors. Besides the 54 respondents, 18 respondents commenced the survey, but did not finish. The answers that they gave were included in the survey analysis.

8.1.7 Estimation of jobs in the FinTech sector

To estimate the number of jobs in the FinTech sector, we used a variety of data sources. Estimating number of jobs in a transversal digitalised industry that is not defined by official NACE-codes is of course subjected to some uncertainty. Thus, our approach is tailored to give the best possible estimation of jobs on the basis of the available employment data.

We have estimated the number of jobs based on the following steps:

1. **Finanssektorens Arbejdsgiverforening's (FA) statistical assessment of no. of IT employees from 2013⁴⁴.** The assessment is based on Statistics Denmark, and the estimated number of jobs is from 2011 due to a time lag in data. According to the statistical assessment, the no. of IT jobs among FA's members is 9,809. FA's members include nearly all the larger players within the financial services sector.
2. **Web-based survey with FinTech companies.** In the survey, we asked the companies to give an estimation of their number of employees that are specifically working in FinTech. In total, the companies in the survey estimate that they employ 4,301 people in FinTech. As some of the companies of the survey are members of FA, their job estimation was not included in the overall estimation of FinTech jobs, thus only 1,331 FinTech jobs from the survey were included in the overall job estimation.
3. **Employment figures from Experian's company database.** We assessed the FinTech employment in the remaining FinTech companies based on the employment figures specified in Experian's company database. Following this approach, we reached a total number of 3,132 FinTech employees. In our estimation of FinTech jobs, we took the different type of businesses into consideration:
 - Start-ups: For the remaining 43 start-ups in the company list we estimated the number of FinTech jobs on the assumption that all employees work in the FinTech area. The assumption was made according to the survey data, where the majority of the start-ups estimate that their proportion of FinTech jobs is 100%.
 - Established suppliers of IT and technology: The estimation of the number of jobs within the established suppliers of IT and technology was based on a careful approach, where we assessed the companies individually. Due to our knowledge from previous studies and from interviews with the national FinTech experts, we assessed that many of the larger international companies have a share of 25% FinTech employees.
 - Suppliers of financial services: For the last type of business 'the suppliers of financial services' we took a conservative approach and did not include these in the number of FinTech jobs, as the key players within the financial services sector are already included in FA's statistical assessment.

In total, we found that there are 14,272 FinTech jobs in Denmark⁴⁵.

For the estimation of the future growth in no. of jobs, we based it on the survey data. In the survey, we asked the companies to specify their job expectations in the next five years. The average expectation is that the number of jobs will increase with 36% in five years, thus we used this estimation for the 14,272 FinTech jobs today – estimating that in 2020 there are 19,410 Danish FinTech jobs. The average increase is not representative for all FinTech companies, thus there is some uncertainty related to the approximation. However, the estimate gives an indication that the companies see a huge growth potential in FinTech.

8.1.8 Benchmark analysis and international case studies

To benchmark the Danish FinTech sector, the project team carried out thorough desk research on relevant literature to study the eight selected FinTech hubs. 18 semi-structured interviews were made with international FinTech experts and stakeholders to identify trends, best practices, strengths and weaknesses of the local FinTech ecosystem. In addition, a survey among a panel of international experts was carried out with the purpose of evaluating their local ecosystem focusing on 1) assessing the importance of a number of conditions for developing a strong FinTech sector and to 2) assessing how well the local ecosystem performs on these parameters.

⁴⁴ FA Statistik (2013): IT-medarbejder statistik 2011

⁴⁵ Based on the following calculation: 9,809 (no. of IT employees among FA members) + 1,331 (FinTech jobs estimated in the survey) + 3,132 (FinTech jobs based on Experian's database) = 14,272

The international cases studies were divided into two groups. Firstly, case studies were made on international front-runners in FinTech to analyse state of the art examples on initiatives. Secondly, four most similar case studies to Copenhagen were carried out. The main goal was here to look at cities similar to Copenhagen and examine successful initiatives and trends. These case studies included:

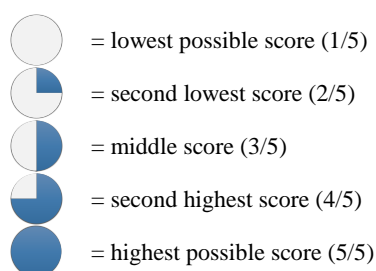
International frontrunners – most different cases	Similar FinTech hubs – most similar cases
New York City	Amsterdam
London	Oslo
Tel Aviv	Helsinki
Singapore	Stockholm

Furthermore, we have carried out a rating of the individual cases on the following six parameters, as these are recognized in the literature as defining factors for creating a strong and successful ecosystem:

- Vibrant FinTech start-up community
- Active established players
- Access to risk capital
- Political support and friendly regulator
- Access to talent
- Brand as a FinTech hub

In our benchmarking we have looked across the eight cases and Copenhagen. Firstly, we have given a score for each of the cases individually, and secondly we have compared the cases to adjust the scores according to the ratings of the other hubs. We have depicted our rating system below.

Rating system:



With a score system ranging from 1 to 5, it is important to be aware that the ratings of the FinTech hubs is general and primarily serves to give an overview of their strengths and weaknesses. For a more nuanced account of the hubs, it is therefore recommended to study the international cases.

