Berlin *aktuell*

Fintechs in Berlin:
An Overview

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Investitionsbank Berlin

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Statement by Berlin's Senator for Economics, Technology and Research

Cornelia Yzer

Germany's fintech sector is marked by a founding spirit. Especially in Berlin where the pace of development has accelerated so quickly in recent times that the city has now become Germany's centre for young fintechs. Around 70 fintech companies are based in Berlin, that's around twice as many as in Frankfurt. In 2015, almost 80m EUR was invested in young finance companies in Berlin. Britain's pending exit from the European Union is leading many fintechs in the UK to consider relocating to the EU and also to Berlin. Back in 2015, Berlin had already overtaken London as the capital for start-ups, clocking up 2.1bn EUR in investment money.

This sector benefits also from Berlin's digital savvy. The capital city is home to innovative digital solutions. Every 20 hours, a new Internet company is set up in Berlin. Every eighth new job is now created in the digital sector. Without digitisation, Berlin's success in recent years as a centre for business and its disproportionate growth would hardly have been possible. It were the digital entrepreneurs in Berlin that not only made the city Germany's capital for start-ups, they were also the nucleus for the strong upswing that can be seen in the city today.

Digitisation in the finance sector also brings with it considerable potential as well as business models. Established value chains will pave the way for new, innovative business models, and in doing so will significantly transform the finance sector. This new edition of Berlin aktuell "Fintechs in Berlin: An Overview" will explore the current status of Berlin's Fintech sector and identify what makes this sector so strong and where there is potential that has yet to be leveraged.

Companies who come here will find a young, international environment with more than 120 co-working spaces. In the last three years alone, more than 3,000 tech companies moved to Berlin. Thirteen DAX companies operate their innovation labs and digital units here. Experts and international talent are keen to move to Germany's capital city since it offers an attractive environment, a low cost of living and a dynamic labour market.

In short, Berlin stands for the three Ts: talent, tolerance and technological strength and the city is now gearing up to take its place at the helm of the fintech sector.

Cornelia Yzer
Senator for Economics, Technology and Research

Editorial by the Chairman of the Board of Investitionsbank Berlin

Dr. Jürgen Allerkamp

Digitisation in the banking sector

Many bank customers regularly manage their bank business online. There are in fact already a number of banks that offer all of their services on smartphones only. These new technical options mean that people now expect something different from their bank. This includes expecting to be able to access bank services no matter where, no matter when.

Whether talking about the "digital economy", "Industry 4.0", "smart services" or "smart networks", the digital transformation has already reached many sectors in Berlin and will lead to dynamic growth in the years to come. These aspects of digitisation were already addressed in previous IBB studies on the digital economy. Far-reaching changes are also taking place in the banking sector. Both banks and their locations must be open to digital transformation. After all, the digital competition landscape is primarily global and fast. Companies with innovative, IT-based business ideas, the so-called fintechs, are gaining a strong foothold on the market. In 2015, around 13.8bn USD was invested world-wide in fintech companies, twice the amount recorded one year earlier. The development curves of fintechs in a global concept will be outlined in this new edition of Berlin aktuell: "Fintechs in Berlin: An Overview".

These new competitors as well as more efficient technologies and more demanding customers have significantly increased the pressure on the established finance sector as a whole. This can be very clearly seen by looking at blockchain technology. This innovation is said to have enormous potential when it comes to cutting costs and improving efficiency and speed. It bears the promise of a revolution in ledger and transaction processes, because financial transaction accounting is available more or less in realtime to all stakeholders. Whether this technology will ultimately prove to be suitable for use in the strictly regulated banking sector depends, however, on many conditions that have yet to be clarified. In the end, the real challenge facing banks will be to judge today which digitisation applications will mature to become the new standard for tomorrow.

Digitisation could hence have a destructive impact on individual business models. The economist Joseph Schumpeter taught that all economic development starts with a process of creative destruction although today were refer more to the concept of "disruptive innovation". Innovation and progress in technology and economics are displacing old structures, ultimately making them obsolete. Against this background, I am convinced that banks need to address these innovative developments from the very beginning. Moreover, we also need to think about how we can promote Berlin as a centre for banking. Without a coordinated strategy for the digital age, both banks and national centres for banking will not be able to compete at international level. Digitisation in the banking sector must therefore be discussed, especially with a view to Berlin's future development as a financial centre.

The digital economy brings positive things to mind such as the permanent availability of the Internet, the transparency of comparison portals, the convenience of smartphone apps and the seemingly free services of many Internet providers. But I believe that it is also very important to look at the negative side of all this. Digital applications can also remain prone to error. Digitised services must undergo critical examination. What's more, digitisation does not change any of the basic tasks and risks that justify both banks and regulations. This also means familiarity with the regulatory conditions that are so very important especially in the finance sector. For certain functions and activities that are subject to supervisory rules, many years of professional experience in the finance sector are a mandatory requirement. The finance system therefore requires players who facilitate basic services, such as lending, deposits and payments. The existence of banks is hence linked to how our business and financial system works. And key aspects of the finance sector, such as the assumption of risks, cannot be managed by anonymous algorithms because by their very nature financial decisions are also paired with uncertainty. That's why I am convinced that banks will continue to be important even in a digital financial market order.

I would like to express my thanks to the authors of this study who have taken a courageous look at the digital future of the finance sector and of Berlin as a centre for banking while opening our eyes to the economic potential on offer. However, we should not sit back and relax in light of developments up to now. Berlin as a centre for banking will have to continue working hard. Although the capital city is the most international city in Germany in terms of fintechs, it has not yet reached its full potential by any means.

By working together, we can successfully pave the way, making use of the enormous opportunities that digitisation has to offer, also for the banking sector, and overcome the challenges that lie ahead.

Dr. Jürgen Allerkamp
Chairman of the Board
Investitionsbank Berlin

Summary

In just a short period of time, Berlin has advanced to become Germany's top location for young tech companies offering unique solutions for financial and insurance services, such as for payments or investments. This trend means enormous opportunities and the sector has been developing at extraordinary speed with exponential growth rates (especially in terms of the venture capital invested in fintechs). On top of that, entrepreneurial fintech pioneers with their easy-to-scale digital business models could benefit from lock-in effects when their offers are used, allowing them to quickly become market leaders in financing and hence gaining a permanent foothold on the market.

At international level, the fintech sector is dominated by North America, especially the Californian cities of San Francisco and Palo Alto, followed by Asia. Last year, these regions not only picked up almost 90% of global investment in fintechs, fintech products are also widely accepted and used there. At European level, London has become established as the most important fintech hub.

At national level, Berlin is setting the tone in the fintech sector. Far ahead of the field, it is competing with other key German financial centres, especially Frankfurt am Main, to win new fintech companies. There are several factors here that benefit Berlin. Take, for instance, its start-up scene which is particularly lively in the field of technology with a vast range of different start-up activities. The city's comparatively low cost of living combined with its high quality of life is attracting and maintaining the creative minds (developers, for instance) that promising start-ups so badly need. But the proximity to government as well as to professional associations is another important advantage for the city because regulatory conditions are particularly important for fintechs.

There are a number of areas of economic policy that can be identified for targeted support of the fintech sector. These include, for instance, the provision of venture capital because limited funds are also one of the biggest growth barriers for fintechs. Furthermore, measures can be taken to promote the – already well-established – transfer of know-how among founders even further. Berlin, as a science hub, offers interesting options for in-depth collaboration between fintechs and universities. An efficient, effective, fintech-friendly administration and infrastructure could act as a catalyst. Finally, measures that help to counteract cybercrime could be useful because security and trust are of paramount importance for the services offered by fintechs.

1. Preamble: Fintechs in Berlin

The digital economy has become an important economic factor in Berlin. Depending on how sectors are defined, companies working in information and communications technology as well as in the media and creative sectors now not only account for significant shares in employment and value added in Berlin, this part of the economy also continues to develop at extraordinary speed. One new Internet company is set up every 20 hours in Berlin and every eighth new job is created in the digital economy.[1]

One field currently experiencing very rapid growth is the technology-driven development of new solutions for financial and insurance services. As an important hub for start-ups, Berlin has also taken a leading position in Germany in this technological sub-sector, i.e. fintech companies, and continues to be visible on an international scale. This is documented by the many new fintech start-ups and the unabated influx of highly qualified people; on top of that, there is also a substantial inflow of venture capital.

Berlin's attraction to fintechs is probably rooted in a set of different, yet closely linked and well-balanced factors, sometimes also referred to as an "ecosystem" but which ultimately seems very difficult to grasp (and hence difficult to quantify). One remarkable aspect, for instance, is that despite the fact that fintechs are focused on the finance and insurance sector, proximity to leading companies in this sector – often an important factor when choosing a location for start-ups (e.g. in the case of spin-offs) – appears to be of little relevance. Instead, it seems that the innovative strength of the ideas and creativity, entrepreneurial spirit and the strengths of digitisation are the important factors for a location. Due to their high (and often even global) mobility, creative minds attach considerable importance not just to economic and institutional conditions, but also to the quality of life at the respective location.

The following (economic) indicators, for instance, could be used in an effort to try and identify the "ecosystem" at a given location for technology companies and to compare these systems at different locations:[2]

- the administrative work needed to start up a company (expressed, for instance, in terms of the time it takes until business activities start)
- the venture capital readily available
- the wage level
- the cost of living
- housing prices
- the number of paid holidays
- commute time between home and workplace.

On an international scale, Berlin frequently comes out tops, faring particularly well when it comes to factors that reflect the quality of life at the location. But Berlin also recently moved up in other categories and a trend towards ”self-reinforcing” mechanisms can even be seen. The international success of Berlin's start-ups has, for instance, encouraged foreign venture capitalists to keep a close eye on the city's creative scene and to invest in new start-ups. And Berlin's own successful founders are now making capital available for new activities. All in all, venture capital amounting to 2.1bn EUR was invested in Berlin last year. That's 70% of Germany's total venture capital volume. For the third time in succession, the capital city is ahead of London where 1.7bn EUR in venture capital was invested in 2015.

Despite the considerable vibrancy and volatility typical of start-up activities,

[1] IBB (2015) Wirtschaftsstandort Berlin: Wachstumsschub durch Digitale Transformation.

[2] These indicators have been used to evaluate the world's leading tech hubs (including Berlin). This evaluation is available online at: http://www.expertmarket.com/focus/research/top-tech-hubs.

fintechs offer considerable opportunity for Berlin as an economic and financial centre. On the one hand, these companies have the potential to sustainably accelerate technological change in the finance sector and hence to rapidly become an important economic factor. On the other hand, Berlin and its very attractive conditions for setting up technology-orientated companies ("ecosystem") offers unique advantages which other locations will find very difficult to copy. Both sector-specific measures (e.g. with a view to the regulatory framework) and location-specific measures (e.g. Berlin's ability to attract young talent) could help to improve prospects for fintechs in Berlin even further.

2. Definition: What are fintechs?

In recent years, a high number of new tech companies have been set up in order to provide financial services. The term fintech is now widely used to describe these companies. The word comes from the two terms "financial services" and "technology" and is designed to highlight the linking of financial services and the technology sector. There are probably a number of factors that led to this distinction from other technology-driven start-ups. The number of new start-ups in this field, for instance, has now reached a significant level so that it appears justified to give this group of start-ups its own label. At the same time, the business model is geared specifically towards a single sector, financial services, and cannot be easily transferred to other sectors. Finally, the technological innovations developed by these companies have the potential to bring about lasting change in the financial services industry, making them the focus of considerable attention.[3]

There are generally three features that characterise fintechs: they offer financial services, are strongly technology-driven, and they do not belong to the traditional finance sector (comprising banks, stock exchange operators and insurance companies).[4]

Fintechs frequently make use of the possibilities offered by digitisation in order to develop new, improved or cheaper solutions for products and workflows, allowing them to compete with existing offers by established financial service providers.[5] Although most fintechs are young companies with just a handful of employees, the definitions that exist usually do not include any limitations in terms of company size so that even large companies working in this field (e.g. Internet or telecommunications) can be counted as fintechs.[6]

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[3] The year 2008 is frequently referred to as being the year in which fintechs emerged. The fact that the first fintechs were set up during the financial crisis is sometimes said to have stemmed from the severe loss of trust in the finance sectors. However, technological developments at that time are more likely to have been the important factor.

[4] Despite the frequent use of the term, there is no uniform, generally recognised definition of fintechs. In addition to the features selected here, emphasis is also placed on the fast rate at which fintechs grow and the disruptive nature of their business models. Both of these criteria are, however, very subjective and appear to be unsuitable for any generally valid definition of the term. The same can be said for the description of fintechs as innovative companies because this would mean that there would have to be new products and processes and this does not appear to be the case for every new company set up.

[5] While banks and financial institutions were the first to be affected by the emergence of fintechs, competition with insurance companies is now also on the rise. This can be seen by the growing popularity of the term insurtech. Other fintech-based new words include, for instance, proptech (property and technology), risktech (risk and technology) and regtech (regulatory technology).

[6] Leading tech companies, such as Google, Apple, Facebook, Amazon and Alibaba, are also sometimes listed as fintechs due to their various different activities, especially in relation to payment transactions.

3. Business fields: What do fintechs do?

Fintechs operate in many business fields that up to now were primarily the domain of banks and financial institutions. The insurance sector is also seeing a growing number of start-ups that aim to simplify important processes and workflows using technical solutions (insurtech). The four most important fintech business fields are presented in brief in the following section.

3.1. Payment transactions

Handling payments is an important source of revenue for banks. On a global scale, these activities accounted for around 40% of total sales recorded by financial institutions in 2014 while the overall market recorded a volume of around 1.5bn EUR (1.7bn USD).[7] This market volume is what has long since made it so attractive to develop solutions to handle payment transactions. At the same time, payment transactions also appear to be prone to change, as can be seen, for instance, by the success of credit card companies like Visa and Mastercard, or online payment systems like PayPal. Using their innovations, fintechs focus primarily on payments with mobile devices (mobile payment), such as smartphones and tablets, and solutions that enable money to be directly transferred between users (peer-to-peer or P2P) as well as cross-border transfers. McKinsey (2015) estimates that 35% of all fintechs are active in payment transactions.[8]

When it comes to mobile payments, the focus is on NFC (Near Field Communication). With this method, data can be exchanged across short distances (a few centimetres) without any contact between a chip and a payment terminal and it is irrelevant for the retailer whether or not the chip is in a smartphone or in a bank card. The main advantage that NFC-based payment systems offer customers is that they simplify and speed up payment transactions[9]; many fintech solutions in fact boast good usability. Due to demanding technical requirements and the importance of network effects[10], major tech companies are also operating in this field next to credit card manufacturers.

For direct money transfers between users, financial institutions are only active in the background. The methods developed are based to a certain extent on existing systems that actually fulfil a different function, but which can be supplemented with a money transfer function (e.g. in the case of communication services); otherwise, independent applications or websites are also developed. Furthermore, foreign transfers can now be carried out at a low cost and more or less independent of financial institutions through various international fintechs. In all three application areas, financial institutions, provided that they are still actually involved in these processes, are less visible to the customer.

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7 McKinsey (2015) Global Payments 2015: A Healthy Industry Confronts Disruption; available online at: http://www.mckinsey.com/~/media/mckinsey/industries/financial%20services/our%20insights/how%20the%20payments%20industry%20is%20being%20disrupted/global_payments_2015_a_healthy_industry_confronts_disruption.ashx.

8 McKinsey (2015) Global Payments 2015: A Healthy Industry Confronts Disruption; available online at: http://www.mckinsey.com/~/media/mckinsey/industries/financial%20services/our%20insights/how%20the%20payments%20industry%20is%20being%20disrupted/global_payments_2015_a_healthy_industry_confronts_disruption.ashx.

9 The development of digital wallets is another area of application. This wallet is an app in which payment functions are combined with the management of loyalty cards and participation in special offers. In addition to NFC solutions, there are also solutions based on WAP (Wireless Application Protocol). In developing countries where bank branches and ATMs are far and few between, SMS-based payment methods are also important. The method that is most widely known and used is the M-Pesa system from Kenya.

10 Network effects are generated when the benefits from the consumption of a product depend on the overall number of people using the product. With a view to payment systems, the individual consumer benefits from systems that are also used and accepted by many other consumers.

3.2. Investment management and deposits

When it comes to managing investments, fintechs can use mathematical methods and computer intelligence to open up new perspectives. First of all, algorithms identify and analyse users' financial behaviour and then issue suitable product recommendations. Aided by so-called robo-advisers, a tailored portfolio can be put together for investors in a matter of minutes. Still, these digital investment managers are often limited to passively managed financial instruments, such as exchange-traded funds[11] (ETFs) that generate relatively low costs and which, as empirical studies have shown, do not necessarily yield lower returns than actively managed equity funds.

In the field of easy-to-automate deposit business, user-friendly solutions are increasingly being offered that can be easily opened, making it no longer necessary to go to the bank. Current accounts on smartphones or access to foreign, high interest term deposits are two examples of new technological developments.

3.3. Lending

When it comes to lending, probably the most traditional field of business for established financial institutions, banks boast the greatest experience in assessing the credit rating of their customers, be it private individuals or companies. Fintechs, on the other hand, are working on solutions to collect and analyse data and information on potential borrowers. Mature algorithms are used as a basis for automated analyses of press reports, annual reports, profiles in social networks, as well as geographic coordinates and IP addresses in order to obtain a reliable profile of a potential borrower. When combined with big data, this could lead to more far-reaching possibilities.[12] The depth of detail in these analyses ultimately depends on how much information is made available to the public and the options permitted by law (data protection).

In addition to methods for credit rating checks, new financing instruments could be used in future for lending, such as P2P financing, crowd funding and crowd investing where several investors are brought together in a group (crowd).[13]

3.4. Insurance companies (insurtechs)

The insurance sector is frequently seen to be particularly conservative and new services are offered by both traditional insurance companies as well as by ambitious insurtechs. One of the first providers of P2P insurance, Berlin-based start-up Friendsurance, distinguishes between six fields of business in insurtech[14]: In health insurance, for instance, wearables are to promote a more healthy lifestyle among users and offer them suitable health insurance services. In P2P insurance, insured parties can support each other; they can form groups in order to share the burden in the event of a claim or to benefit from

[11] Exchange-traded funds (ETFs or index funds) track the development of their underlying market index, such as the DAX, as closely as possible. Because they do not aim to outdo the index, they belong to passive investment strategies. ETFs enable simple trading of entire markets with relatively low transaction costs.

[12] For both banks and fintechs, credit rating checks mean collecting and analysing information. What's special about these information costs is that they are not in proportion to the loan amount requested. Comprising a fixed and a variable component, these costs are instead described by a cost curve that declines as the loan sum increases which ultimately means that small loans (e.g. to small companies or private individuals) are comparatively harder to come by. Methods that lead to lower information costs could be useful here.

[13] The phenomenon where certain financial services pose the risk of intermediary financial institutions being removed from their function is referred to (in the finance sector) as disintermediation.

[14] An overview with explanations for this possible breakdown of insurtech business fields can be found online at: https://www.friendsurance.de/blog/infografik-insurtech-unternehmen.

lower no-claims costs. Spot insurance refers to the selling of situation-based temporary insurance (e.g. for car rentals or business trips). eCommerce insurance includes insurance for electronic devices, such as smartphones or smartwatches. So-called usage-driven insurance models focus on the actual use behaviour of the insured party. With a view to motor vehicle insurance, for instance, this can mean that the insurance premium is not primarily determined by driving experience (years driving) but also by which car is driven, where, how far and when (so-called pay-as-you-drive (PAYD) or pay-how-you-drive (PHYD) offers). Finally, contract management/brokerage covers offers that aim to offer clear-cut digital management of insurance contracts and/or operate as online insurance brokers.

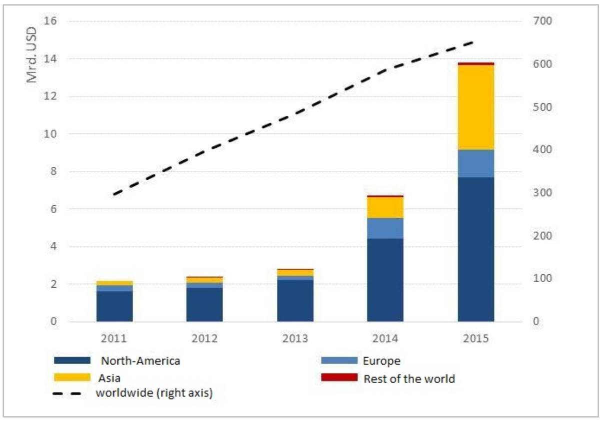
4. Importance: How relevant are fintechs?

4.1. Investments

Investments in fintech companies have risen rapidly in terms of the venture capital made available.

Last year, consultancy firm KPMG together with CB Insights recorded 653 transactions worldwide with a total investment volume of 13.8bn USD, so that the volume of investment had more than doubled compared to 2014 (6.7bn USD). [15] The increase was particularly strong in Asia where investments have increased by a factor of 22 since 2011, i.e. from 220m USD to 4.5bn USD.

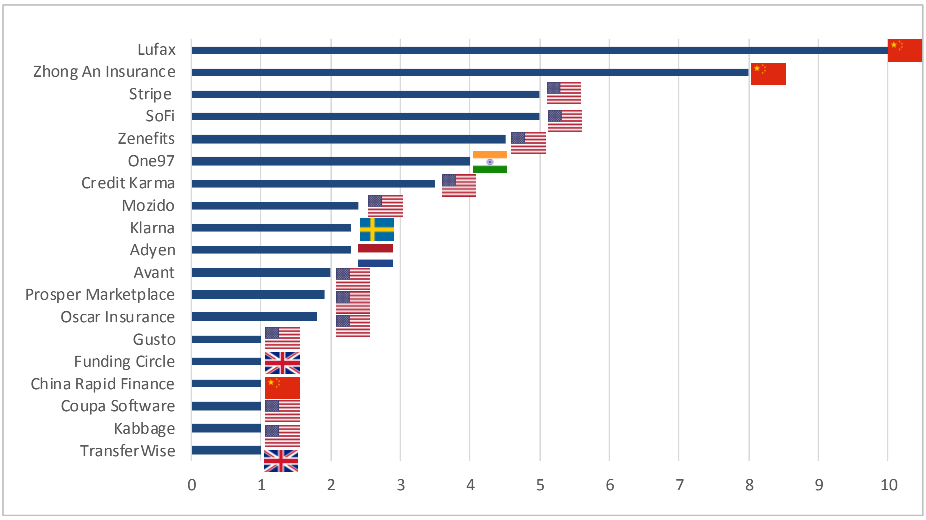
Fig. 1: Global volume of investment in fintechs



Sources: KPMG, CB Insights.

That being said, North America (especially the United States) continues to be the most important fintech hub where the recent volume of investment totalled 7.7bn USD. Compared to this, Europe ranked third behind Asia last year (2015) with an investment volume of around 1.5bn USD.

Fig. 2: Fintechs valued at >1bn USD



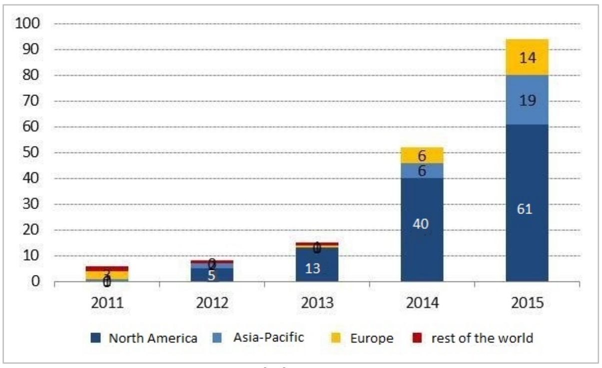
Source: Accenture.

[15] KPMG and CB Insights (2016) The Pulse of Fintech, 2015 in Review; available online at: https://www.kpmg.com/CY/en/topics/Documents/the-pulse-of-fintech.pdf.

Big deals with an investment volume of more than 50m USD are the driving force behind this development. In the past, these deals primarily took place in North America. Of the 94 big fintech deals (> 50m USD) that took place last year, for instance, 61 were conducted in the US and Canada. During the same period, 14 took place in Europe and 19 in the Asia-Pacific area.

Just like with other start-ups, it is the big and particularly promising fintech companies, i.e. those valued at more than 1bn USD on the venture capital market, that are the focus of attention. CB Insights currently lists 163 such companies world-wide with a total value of 584bn USD which include 19 fintechs. Eleven of these companies are in the US with four each in Europe and Asia. Lending and payments are the areas most strongly represented with eight and six companies, respectively.[16]

Fig. 3: Number of deals with a volume of > 50m USD

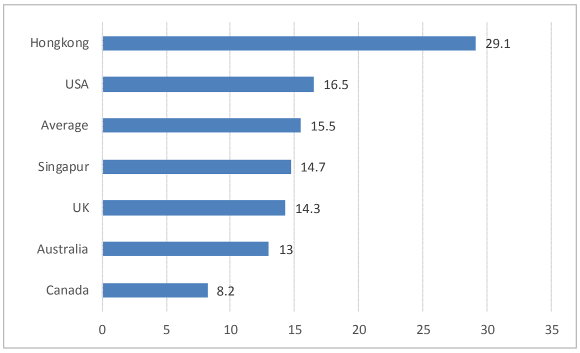


Sources: KPMG, CB Insights.

4.2. Usage

Almost no reliable data is available regarding the actual use of fintech services. Consultancy firm Ernst & Young (2015) conducted a survey among users of digital services in Australia, Hong Kong, Canada, Singapore and the US in order to gain an insight into the use of fintech products.[17] The result is the so-called Fintech Adoption Index which shows Hong Kong to be the clear leader among the five countries surveyed.

Fig. 4: EY Fintech Adoption Index



Source: Ernst & Young.

29.1% of the people polled there had used at least two fintech offers in the last six months. When broken down according to cities, New York (33.1%) leads the field, followed by Hong Kong (29.1%) and London (25.1%). The services most widely used were money transfer systems (payments) (17.6%), followed by products related to investment management and deposits (16.7%), while the use of insurtech products was seldom reported (7.7% of those polled).

4.3. Co-operation vs confrontation

When it comes to the future of fintechs, it is extremely important how they are positioned in relation to established players in the finance sector. At present, there is a growing trend towards co-operation where banks and insurance companies are increasingly including fintech services in their product portfolios. A number of fintechs have in fact been taken over by major banks (such as Goldman Sachs, UBS, Santander or BBVA).

[16] A current list of all start-ups valued at more than 1bn USD is available online at: https://www.cbinsights. com/research-unicorn-companies.

[17] Ernst & Young (2015) EY FinTech Adoption Index: Key Findings; available online at: https://emeia.ey-vx.com/984/59145/documents/ey-fintech-adoption-index.pdf?sid=c888963d-9b1a-4848-ad6f-f02e7961fc07.

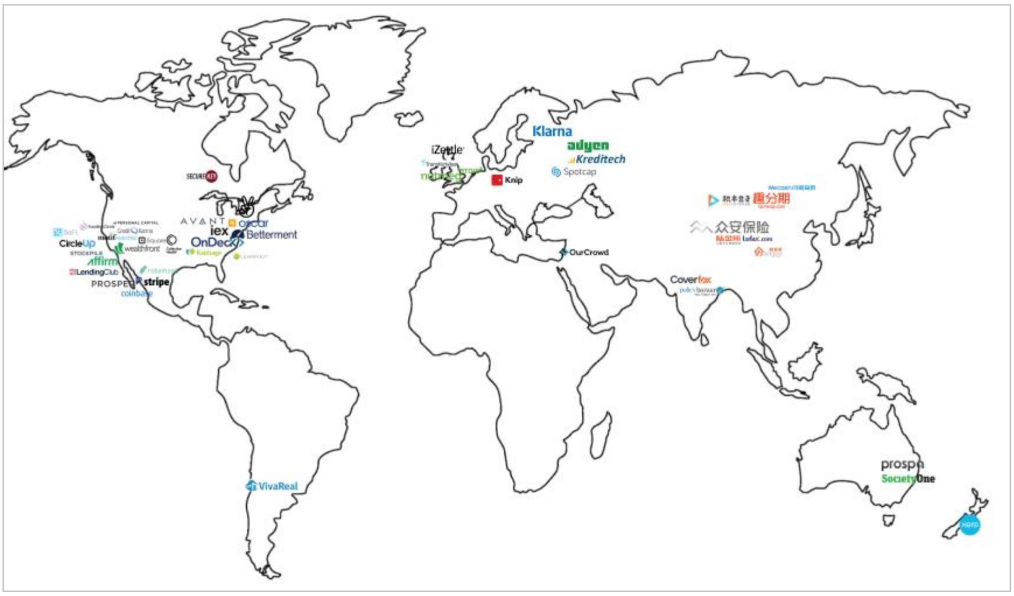
Extensive dialogue is also underway.[18] Since fintechs frequently specialise in individual services, co-operation with individual banks and insurance companies is often mandatory if the business model is to be successfully implemented. This means that a fintech's relationship with the traditional finance sector is often likely to develop dynamically (and alternate between partners or competitors). Attached to this report is an overview in which the strengths and weaknesses of established financial institutions are compared to those of fintechs.

5. Locations: Where are fintechs located?

5.1. Countries

The United States (and especially the cities of San Francisco and Palo Alto) is considered to be the birthplace of fintechs. Several indicators, such as the number of companies in the fintech sector, the volume of investment, the number of highly valued companies and various rankings highlight the outstanding position of the US in this field and the strong concentration in California. Consultancy firm KPMG together with H2 Ventures, for instance, regularly publishes a top 100 fintech list made up of 50 of the world's leading fintechs and 50 emerging stars.[19] According to this list, 25 (50%) of the 50 leading, established fintechs are based in the United States, seven in China (14%), five in the United Kingdom (10%) and two in India, Australia and Germany (4% each). expanding the view to include all of the fintechs analysed has very little effect on the overall picture. In this case, 35% and hence proportionately less (-15 percentage points) of the top 100 fintechs are located in the US while 17% of fintechs are from the United Kingdom (+7 percentage points), 9% from Australia (+5 percentage points), 8% from China (-6 percentage points), 6% from Israel (+4 percentage points) and 5% from Germany (+1 percentage point).

Fig. 5: KPMG top 50 fintechs 2015 worldwide



Sources: KPMG and H2 Ventures.

[18] These include in Germany, for instance, the Main Incubator and CommerzVentures startups by Commerzbank and the establishment of innovation labs by Deutsche Bank in Berlin, London and Palo Alto which are to facilitate exchange with fintechs. In insurance, Allianz, for instance, has set up Allianz Digital Accelerator and Munich Re the Ergo Digital Lab in Berlin.

[19] The companies were selected on the basis of five criteria. These refer to the capital raised in terms of amount and speed, the geographic and sector diversity, consumer and marketplace traction as well as degree of innovation. (Original description of the criteria (p. 2 Fintech 100): 1. Total capital raised 2. Rate of capital raising 3. Geographic & sector diversity 4. Consumer & marketplace traction 5. X-factor: degree of product, service and business model innovation (a subjective measure that is applied only with respect to companies outside of the top 50 on the list)). The publication is available online at: http://fintechinnovators.com/

Fig. 6: Geographic spread of KPMG's top 50 fintechs

Ranking	Country	No. of top 50 fintechs	Share	City	No. of top 50 fintechs	Share
1.	United States	25	50%	San Francisco	13	26%
2.	China	7	14%	New York	5	10%
3.	United Kingdom	5	10%	Beijing, London	4	8%
4.	Australia, India, Germany	2	4%	Palo Alto, Shanghai	2	4%
5.	Brazil, Canada, Israel, Netherlands, New Zealand, Sweden, Switzerland	1	2%	including Berlin, Chicago, Hamburg, Sydney, Stockholm, Zurich	1	2%

Sources: KPMG and H2 Ventures.

The ranking only changes significantly when the number of "national" fintechs in the top 100 is put into relation with the overall population.

In this case, Israel would be the outright market leader, followed by Australia, Singapore, the United Kingdom and Switzerland. Looking at cities, San Francisco is far ahead of the field of top 50 important fintechs (13 fintechs), followed by New York (5), Beijing and London (each with 4). Germany's two top fintechs are based in Berlin (Spotcap) and Hamburg (Kreditech).

A similar study by FintechCity limits itself to 50 highly promising fintechs in Europe (including Israel).[20] According to this listing, the United Kingdom is the most important European fintech hub by far with 31 of the top 50 companies, the majority of which are based in London. Compared to this, Germany (7 companies), Switzerland (3) and the Netherlands (3) lag far behind. Two fintechs are from Israel and two from Sweden with one fintech from Ireland and one from Israel. Five of the German fintechs on the list are based in Berlin: (Barzahlen, Mambu, Number26 [now N26 Bank], Raisin, Spotcap) with the other two based in Munich (Fidor Bank) and Frankfurt (Traxpay).

Other sources confirm the picture of a strongly Anglo-Saxon dominated fintech landscape with Asia as an up-and-coming player and a heterogeneous landscape on continental Europe without any specific geographic centre.[21]

The most important countries of origin for fintech services are currently (in alphabetical order):

- Australia
- China
- Germany
- Israel
- Singapore
- Sweden
- Switzerland
- United Kingdom
- United States of America.

[20] The survey is the result of an analysis of more than 1,200 European fintechs. The current 2016 edition is available online at: http://fintechcity.com/the-fintech50-2016/4592118119.

[21] In young and volatile sectors, statements like these must be seen as a stock-taking exercise. Some companies and fintech hubs that were highly viewed in the early days have already disappeared.

5.2. Cities

Cities offering an international, particularly fintech-friendly environment include (in alphabetical order):

- Berlin
- London
- New York
- San Francisco/Palo Alto
- Singapore
- Stockholm
- Sydney
- Tel Aviv.

These locations seem to offer certain conditions that are particularly conducive to setting up and operating fintechs. The next section will briefly take a closer look at these fintech cities, except for Berlin as its conditions are described in detail in the following sections.

London is considered to be Europe's fintech capital and is also the financial centre for the continent. According to a recently published study by Ernst & Young on behalf of Britain's Treasury, fintechs in the UK generated turnover of 6.6bn GBP (2015) and employed 61,000 people which corresponds to 5% of jobs in Britain's finance sector.[22] Some of the city's strongest selling points for fintechs include first and foremost its role as the world's leading and long-standing financial centre which means that (venture) capital and suitable employees are readily available, while efforts by the British government to improve this position are also widely recognised. This support by government comes in different forms. On the one hand, a "regulatory sandbox“ of the Financial Conduct Authority[23] allows fintechs to try out new financial services without having to expect the normal regulatory consequences, whilst on the other hand, the government helps start-ups with tax relief measures and directly supports the Tech City technology start-up cluster or the Level39 fintech incubator.

New York can be compared with London in that it is the world's other major financial centre (second after London according to the Global Financial Centres Index). This creates the same picture with outstanding opportunities for financing and readily available qualified staff. The number of people employed by fintechs is also comparable, which Ernst & Young reports to be around 57,000. One strength of this hub that must be highlighted is the infrastructure there, offering numerous accelerators and incubators as well as close co-operation with established financial service providers.[24] It also seems that the strong commitment of business angels and venture capitalists is paying off as growth rates for investments in fintechs worldwide are now second to none. Market size is another factor in New York's favour.

San Francisco and **Palo Alto** are two geographically separate cities which differ both in terms of size and economic structure. While Paolo Alto is just a small city with a population of around 67,000, it is globally renowned for its IT industry, its research capability and its proximity to Stanford University. San Francisco, on the other hand, is a big city (population of around 864,000) with many business areas and one of America's many financial centres. Together with a number of other cities, such as Cupertino, Mountain View or San José, these two communities are part of Silicon Valley that is often seen as a coherent and well-functioning ecosystem and an unmatched model for other regions around the world. The region's tech dominance is the key to its strength in the

[22] Ernst & Young (2016) UK FinTech. On the cutting edge. An evaluation of the international FinTech sector; available online at: http://www.ey.com/UK/en/Industries/Financial-Services/Banking---Capital-Markets/EY-UK-FinTech-On-the-cutting-edge

[23] Financial Conduct Authority (FCA). They also offer free consultancy services for founders.

[24] There is much co-operation between the finance industry and fintechs, especially when compared to Germany. In addition to a number of acquisitions, the finance industry also acts as a supporter and as an infrastructure provider. Examples include Barclays Accelerator, JP Morgan's fintech hub or the fintech innovation lab of consultancy firm Accenture.

fintech sector. The cities also benefit from their early experience as fintech pioneers, a strong start-up culture and readily available venture capital.

Sydney is of lesser importance as a global financial centre (ranking 17 on the Global Financial Centres Index and hence directly before Frankfurt). That being said, a KPMG study shows that the finance sector accounts for a large part of Australia's economic output and tax revenues, with this sector employing around 78,000 people in Sydney alone.[25] A business-friendly environment and government support are the two main pillars of Sydney's success story. Other aspects include measures as part of the National Innovation and Science Agenda (NISA), such as tax breaks for start-ups, the promotion of risk capital and investments in incubators (8m AUD beginning July 2016).[26]

The city state of **Singapore** has managed to earn a place for itself among the world's top economies, a fact that is confirmed in many different rankings. In the Global Financial Centres Index, Singapore ranks third after London and New York, in the World Bank's 2016 Ease of Doing Business Index, Singapore came first out of 189 countries and in the Global Competitiveness Index 2015-16 by the World Economic Forum it came second out of the 140 economies surveyed. When it comes to its strength as a fintech hub, many blogs and studies list the city among the world's top fintech hubs. The reasons for this are likely to be found it its very business-friendly environment and strong government support. The Central Bank[27], for instance, has a fintech office that is to serve as a point of contact and a marketer for national fintechs, and the government offers a fintech-based regulatory framework in co-operation with the Central Bank which also acts as the financial market supervisory authority.

Stockholm is Scandinavia's financial centre, but on an international scale it is not of major importance as a place of finance (ranked 37 according to the Global Financial Centres Index). Compared to other currently successful fintech cities, the difference here is that the development is less government-driven and there is not such a strong financial ecosystem of accelerators and incubators as elsewhere.[28] The driving factor here seems to be the Swedish people's enthusiasm for technology which is reflected in the enormous popularity of smartphones, the active use of digital offers and the growing trend away from cash.[29] Flat work hierarchies and co-operative working conditions are also occasionally listed as factors to explain this fintech success.

What's remarkable about **Tel Aviv** as a fintech hub is that despite the city's modest size and its rather decentralised (and also problematic) geographic location, it is home to a disproportionately high number of fintechs.[30] Looking at the number of successful fintech start-ups in relation to the population, it appears reasonable to refer to Tel Aviv as the world's most successful hub. The dimensions and interna-

[25] KPMG (2014): Unlocking the Potential: The Fintech Opportunity for Sydney; available online at: http://www.sydney.org.au/media-release-unlocking-the-potential-the-fintech-opportunity-for-sydney/

[26] Information regarding the National Innovation and Science Agenda is available online at: http://www.innovation.gov.au/page/agenda

[27] Monetary Authority of Singapore (MAS).

[28] Wesley-James, Ingram, Källstrand, and Teigland (2015): Stockholm FinTech: An Overview of the FinTech Sector in the Greater Stockholm Region; available online at: https://www.hhs.se/contentassets/b5823453b8fe4290828fcc81189b6561/stockholm-fintech---june-2015.pdf

[29] Different rankings confirm Sweden's top spot when it comes to the use of modern technology. In the Global Competitiveness Index 2015-16 by the World Economic Forum, for instance, Sweden's economy came fourth out of 140 countries in the Technological readiness categories only to be outdone by Luxembourg, Switzerland and the UK.

[30] Some of these developments have become international stories and were sold at high prices. Examples include FeeX, which is very successful in the US, and BillGuard which was taken over in 2015 by Prosper Marketplace.

tional expertise in financing and the generally very high qualification level in Tel Aviv and Israel are likely to contribute to this success. Many international banks, such as Citibank (Citi Innovation Lab) and Barclays (Barclays Accelerator)[31], are present there along with companies from other sectors, helping to promote vigorous knowledge transfer. At the same time, the high level of development in cybersecurity and data analytics, some of which is probably the result of military research, is also having a positive impact.

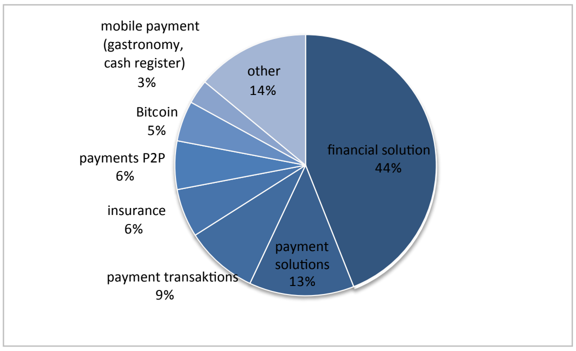
An overview of selected fintech hubs outside Germany can be found in the appendix.

6. Fintechs in Germany

6.1. Overview

The development of Germany's fintech sector is very dynamic. Estimates regarding the number of German fintech companies vary between 250 (Ernst & Young) and 405 (Barkow Consulting). According to the categories used by Barkow Consulting, the main areas of business are financial solutions (44%), followed by investment services (13%) and payment solutions (9%).[32]

Fig. 7: German fintechs according to business fields



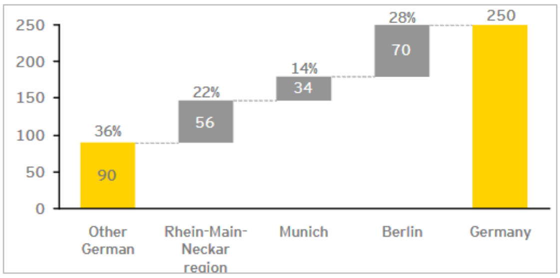
Source: Barkow Consulting.

[31] Barclays has four accelerators in total, i.e. in New York, London, Cape Town and Tel Aviv.
[32] The assessment of the fintech sector by Barkow Consulting is available online: http://www.barkow-consulting.com/barkow-consulting-fintech-money-map/.

Germany's strongly federal and decentralised structure is also reflected in the geographic distribution of fintechs. In Germany, Frankfurt am Main, Munich and Hamburg are also important hubs in addition to Berlin.

Hamburg-based Kreditech, a scoring company, and Spotcap, a lending platform based in Berlin, are among the world's top 50 fintechs identified by KPMG and H2 Ventures. When extended to include the top 100 fintechs, the picture now shows Fidor Bank (Munich), Friendsurance and Number26/N26 Bank (both Berlin). According to Deutsche Bank, around half of all German fintechs are based in Berlin, with Munich, Hamburg and Frankfurt lagging far behind.[33] By contrast, Ernst & Young claims that German fintech activities focus on three regional hubs: Berlin, the Rhine-Main-Neckar region and Munich, with the first two being located close to each other.[34]

Fig. 8: Geographic distribution of German fintechs



Source: Ernst & Young (2016).

By international standards, the low cost level (rent and cost of living) found in Berlin, Frankfurt and Munich, which is much lower than in New York, London or Singapore, is usually considered to be one of

[33] Deutsche Bank (2015): German Fintechs and traditional banks: Friend or Foe?; available online at: https://www.dbresearch.com/PROD/ROD/A_German_FinTechs_and_traditional_bank.pdf
[34] Ernst & Young (2016): German Fintech landscape: opportunity for Rhein-Main-Neckar; available online at: http://www.ey.com/Publication/vwLUAssets/EY-FinTech-study-Germany/$FILE/EY-FinTech-study-Germany.pdf

the important strengths of the German fintech scene. Germany is also a strong technology hub with enormous digital expertise which is so vital for the fintech sector. Ernst & Young describes the German market with around 13,000 employees as being "large but complex" and refers to efforts to better integrate fintech activities.[35]

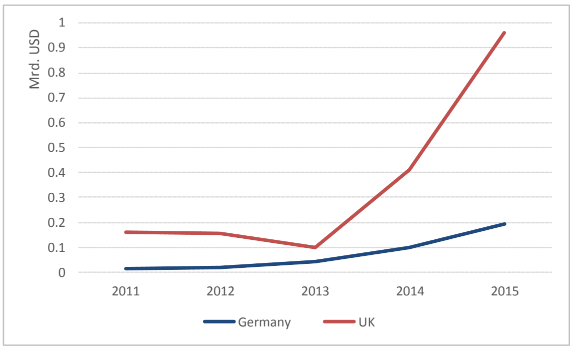
6.2. Relevance

According to CB Insights, investments in German Fintechs in 2015 totalled 193m USD while investments for the same period in the United Kingdom totalled 962m USD, around five times that amount. That being said, investments here in Germany have picked up in recent years considering that in 2011 only 13m USD was invested. With all of these investments, venture capital was the most important source of money for Germany's fintech start-ups.

According to an analysis by Barkow Consulting of a total of 514 investments, 42% were venture capital investments, while incubators accounted for a share of merely 3% and were hence of minor relevance.

This same analysis showed that in most cases investors were from Germany (65%) followed by the US (9%) and the UK (5%).

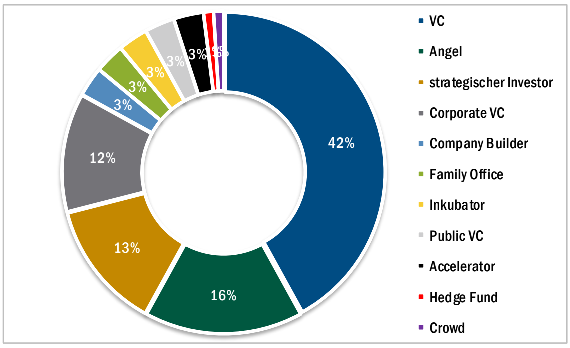
Fig. 9: Investment in German fintechs



Sources: KPMG and CB Insights.

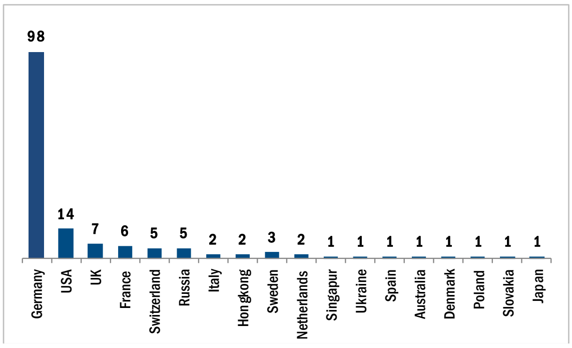
In 2015, Dieter von Holtzbrinck Ventures was the most active investor in the German fintech market with nine investments. This was followed by the German Startups Group with eight investments as well as Rocket Internet and High-Tech Gründerfonds, each with seven investments.

Fig. 10: Overview of investor types



Source: Barkow Consulting.

Fig. 11: Investors according to origin



Source: Barkow Consulting.

6.3. Locations

Unlike other countries (such as Australia, Israel, Sweden or the United Kingdom), Germany does not have one particular location that dominates the entire sector as the sole fintech hub. However, activities in this sector are clearly focused on the two hubs of Berlin and Frankfurt, each of which has its own particular strengths.

Berlin is Germany's most important fintech hub by far, both in terms of the number and the size of the companies working there. The more well-known fintechs based in Berlin include Weltsparen, Fairr and Number26/N26 Bank, all of which were recently honoured in the choice of Germany's fintech start-up

[35] Ernst & Young (2016): UK Fintech on the Cutting Edge; available online at: http://www.ey.com/Publication/vwLUAssets/EY-UK-FinTech-On-the-cutting-edge/$FILE/EY-UK-FinTech-On-the-cutting-edge.pdf

of the year 2015.[36] Even in international terms, Berlin is very attractive as a place for business and as a place to live. One of the central advantages of Berlin is its strong digital economy that is becoming more and more a creative driver of innovation. The many talented minds and developers from the ICT sector help start-up companies to quickly roll out the business models and to recruit the qualified staff needed. Start-up entrepreneurs also praise the low level of costs and the creative potential of the capital city as attractive hub factors. International groups, such as Deutsche Bank (with its Innovation Lab), Roland Berger and Visa Europa (with a joint digital hub), are present in Berlin beside incubator Finleap and Cologne-based DvH Ventures[37], which is very active investing in Berlin, along with German Startup Group and Rocket Internet.

Although **Frankfurt** has a much lower number of fintech start-ups than Berlin, it is Germany's most important financial centre and has an allegedly "fintech-typical" environment and the advantage of proximity to the finance industry which means better networking, a qualified workforce and a corresponding infrastructure. This infrastructure includes, for instance, Deutsche Börse's fintech centre, which opened this year, as well as a fund set up by the stock exchange operator (Illuminate) which is to invest in finance start-ups, Commerzbank's main incubator and CommerzVentures, the fintech incubator and investor finlab, and above all, the many regular events that are designed to promote exchange (e.g. the monthly "Between the Towers" event). Furthermore, beginning next winter semester, the Frankfurt School of Finance and Management will offer Germany's first ever "Digital Innovation and Fintech" in-depth course as part of business administration studies. The federal state government of Hesse is actively involved in attracting fintechs and recently set up a founder centre for companies in this sector.

7. Success factors: What makes fintechs successful?

Entrepreneurial activities are prone to risks so that it is often very difficult to predict whether or not an endeavour will be successful. This is especially true in the case of start-ups where there is considerable uncertainty regarding future developments and where success depends on many factors, not least on chance. That being said, some criteria are identified that can have a positive impact on the chances of success for a start-up in the fintech sector.

7.1. Expertise

The basis for the success of technology-orientated start-ups, which include fintechs, is very likely to be the company's own **technological expertise**. These companies typically have a business model that is geared to providing an innovative technical solution; this solution must be devised, developed and implemented and this calls for technological know-how. This means that the requirements profile for developers is likely to differ in many ways – at least in terms of how capabilities and skills are weighted – from the activities to be performed at established companies. The establishment of new companies is often driven by visions in which existing workflows and processes are often radically changed. New, particularly innovative ideas and developments especially call for a certain degree of unconcern. At the same time, it is very important for the success of a start-up to have a very specific idea about the technical feasibility of the ideas. Finally, due to enormous competition pressure and limited funds, fast action is also required. The technical solution must also be extremely reliable. Since many start-ups are based on a single, very specific business idea, the success of the start-up would be seriously threatened if the service offered were not available or could not be used.

[36] The prize for fintech start-up of the year is awarded by paymentandbanking.com. For more information about this year's awards, see: http://t3n.de/news/fintech-startup-des-jahres-2015-676974/.

[37] Investment company of Dieter von Holtzbrinck, parent company of Handelsblatt.

Due to their focus on the finance sector, it is also essential for many fintechs to have **business experience** in financing. The development of new solutions requires familiarity with the services on offer and detailed knowledge of the processes and workflows previously used. This also means familiarity with the regulatory conditions that are so very important especially in the finance sector. Certain functions and activities even require (many years of) experience in the finance sector due to supervisory rules, especially when fintechs are to set their sights on banking licences in order to independently implement their business models.[38] Fintechs can also benefit from good networking when it comes to acquiring the necessary financing for their business activities. Good ties with banks and insurance companies can also be useful when setting up business cooperation.

Ultimately, the success of any start-up probably depends on the **entrepreneurial implementation** of the business idea. Despite having a promising idea, many new start-ups actually fail due to practical mistakes. In the fintech sector, this problem is likely to be particularly acute due, for instance, to comprehensive regulatory requirements.[39] Many start-ups also pursue the same or similar business models and hence compete directly with each other.

7.2. Environment

The pool of employees who have the above described expertise needed in this sector is limited. What's more, this group of individuals is often very mobile (even beyond national borders).

[38] The Federal Financial Supervisory Authority has also set up its own information page for fintechs that is available online at: https://www.bafin.de/DE/Aufsicht/FinTech/fintech_node.html;jsessionid=895949F040DDC563384B1BF0BFB9AB28.1_cid363.

[39] This problem is exacerbated further by the fact that for many start-ups the scaleability of their business models, with all their different requirements and uncertainties, is an important part of their business.

This means that when fintechs and their founders are looking for a location, it is likely to be important that they find an attractive and pleasant living environment that is typically summed up in literature as "**quality of life**". Quality of life can include very different aspects, ranging from a lively culture scene (including bars, restaurants, museums, opera houses) to good infrastructure as well as an open, tolerant, discrimination-free social environment.

It is also important for fintechs to identify, attract and win over the right kind of **talent**. Talent can be trained on site and this means that educational institutions with the right focus are needed. A general "entrepreneurial spirit" is also helpful because spin-offs from existing companies are a typical pattern for start-ups. However, founders can also attract talent by convincing them to move to the hub. The quality of the location is likely to be a major factor in decisions made by this group of individuals, especially in light of international competition.

7.3. Framework conditions

Regulatory framework conditions are a crucial aspect for fintechs. The implementation of business models in the finance sector is subject to various supervisory regulations and this entails a considerable amount of work. This involves, for instance, the reliable identification of all of the respective regulatory requirements which also frequently change over the course of time; weighing up possibilities to meet with these regulations (which can also mean having to omit certain business activities); and performing a lot of work (including reporting obligations) to meet with these requirements. Another obstacle in Europe is the fact that legal requirements often differ from one country to the next so that a business model may call for very different legal forms and reporting obligations. Since scalability, i.e. the possibility to implement the business model in different European countries (at the same time), is an important part of business success, this obstacle is a significant disadvantage for a hub when compared to the United States. Any attempt to achieve harmonisation at European level should, however, not mean agreeing to the smallest common denominator, i.e. deregulation. The global financial crisis clearly highlighted the risks of insufficient regulation of financial markets. A well-run supervisory authority also helps to protect fintechs against developments in the sector which could prove to be unsustainable.

Financing business activities has always been difficult for start-ups. Surveys conducted among founders show that access to capital is often the biggest obstacle for the successful implementation of a business idea.

8. Evaluation and recommendations

8.1. Opportunities

The economic potential of fintechs is primarily determined by rapid and currently still exponential **sector growth**. Seen in terms of economic parameters, such as the number of jobs or added value, the economic importance of start-ups in this sector has been very modest up to now even if this is difficult to identify and precisely classify. At the same time, the sector is growing at a rapid rate; the fact of the matter is that speed is of essence for the success of a start-up. Moreover, the market for financial services has considerable volume, although it is at present very difficult to estimate how much of the market fintechs could capture.

In this context, possible **lock-in effects** are particularly important. Due to the radical changes in the finance sector, entrepreneurial pioneers, so-called first movers, with their innovative products could quickly become market leaders and gain a lasting foothold on the market. Fintechs could, for instance, benefit from a high level of customer loyalty since consumers who have decided to use a technical solution find it hard to change to a new service. Due to the scalability of their digital business models, fintechs could also quickly increase their customer base without all too much effort.

8.2. Risks

There are many uncertainties regarding the future development of fintechs irrespective of uncertainty regarding the feasibility of the business models of individual companies, which are in the case of start-ups particulary high. It is at present very difficult to estimate when and if at all new offers and solutions will prevail on the market. **User behaviour** in Germany is very conservative in many areas. Deutsche Bundesbank (2015, p. 10) points out, for instance, that "where the use of payment instruments is concerned, there is only limited willingness to experiment" and the downward trend in the use of banknotes and coins is also reported to have slowed down significantly lately. [40]

Acceptance of fintech services will depend heavily on user affinity for technology, which is likely to increase thanks to growing demand among upcoming generations, and especially the **trustworthiness** of the solutions offered. If new technical developments prove to be uncertain, customers will be quick to turn their backs on such offers and to search for alternatives. Therefore, it is not only consumers but also fintechs as suppliers who should be keen to welcome useful and effective regulation, including an efficient supervisory authority.

Up to now, fintechs have focused on developing products that are easy to standardise and to automate. But as business activities expand further, **complexity** could very well increase. The challenges that this poses for fintechs range from converting the business model to adapting organisational structures and even as far as changed regulatory requirements. Forecasting how fintechs could develop is ultimately made even more difficult by

[40] Deutsche Bundesbank (2015): Zahlungsverhalten in Deutschland 2014; available online at: https://www.bundesbank.de/Redaktion/DE/Downloads/Veroeffentlichungen/Studien/zahlungsverhalten_in_deutschland_2014.pdf?__blob=publicationFile.

strong **competition in the sector**. Since some of the fintech business models overlap, consolidation appears to be inevitable. There is also considerable uncertainty regarding the relationship between fintechs and established financial service providers. If financial institutions and insurance companies can manage to successfully implement in their own portfolios the solutions developed by fintechs, it is doubtful whether fintechs will continue to exist as independent undertakings. A takeover of a complete developer team could then mean moving to a new location (to company headquarters).

8.3. Berlin as a fintech hub

In international terms, Berlin as a fintech hub benefits strongly from the lively **start-up scene** in the city. In recent years, Berlin has gained an international reputation as a strong innovation and technology hub. The digital economy is present everywhere in the city. No other German city can boast such a start-up-friendly environment. The many start-ups, especially in technology, are not just proof of the entrepreneurial spirit that exists in the city, but also attract talent and especially developers.

One of the reasons why Berlin's fintechs have been able to recruit international talent too is the high **quality of life** that the city has to offer and its international population. As a major city in Europe, Berlin has an excellent international reputation as a place to live and work.

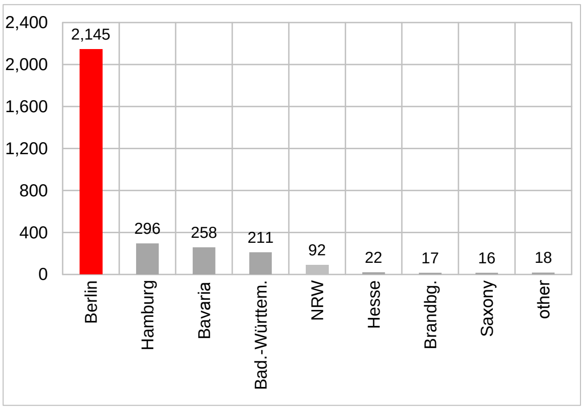
Since regulatory conditions are of particular importance for fintechs, **proximity to government** is another important advantage. Berlin is also home to important business associations and lobbyists, including Bitkom, a lobby group committed to digital topics.

Finally, the geographic **scattering of the finance sector** in Germany indirectly benefits Berlin. Although the major banks are based in Frankfurt am Main, there are other important finance hubs (for instance, Hamburg, Düsseldorf, Hanover and Munich) that can offer fintechs the opportunity to participate in active exchange during the development and creation of solutions for financial services. Berlin is home to one of Germany's biggest direct banks, Deutsche Kreditbank.

In 2015, venture capitalists invested a record 2.1bn EUR in start-ups in Berlin. The availability of venture capital is another reason why Berlin is so attractive for founders.

- In 2015, start-ups in Berlin received a good 2.1bn EUR in venture capital. This means that in 2015 around 70% of all venture capital in Germany (3.1bn EUR) was invested Berlin's start-up scene.
- Berlin is followed by Hamburg and Bavaria in second and third place, respectively, in the ranking of federal states. The start-ups based there received venture capital totalling around 300m and 260m EUR, respectively, in 2015.
- In 2015, almost 3.1bn EUR was invested in German start-ups, that are five times more than in 2013 and almost twice as much as in 2014.
- Across Europe too, the volume of investment is rising.
- In 2015, almost 1.8bn EUR in venture capital was invested in start-ups working in consumer services/online retail, corresponding to 58% of the overall volume of venture capital financing.
- This was followed in second place by financial services/fintechs: A good 600m EUR in venture capital was invested in start-ups in this field.
- Thanks to a huge increase in venture capital investments, Berlin was able to defend its leading position from last year and even extend its lead over London in second place.
- Hamburg and Munich are two more German cities that managed to rank among Europe's top 6.Across Europe, a total of 1,433 venture capital investments were counted in 2015, two thirds of them in the three main markets, i.e. Germany, the UK and France.
- While the number of venture capital investments rose significantly in Germany in 2015, the UK recorded a steep decline in this figure. France saw moderate growth.

Fig. 12: Volume of start-up financing in Germany in 2015 (in m EUR)

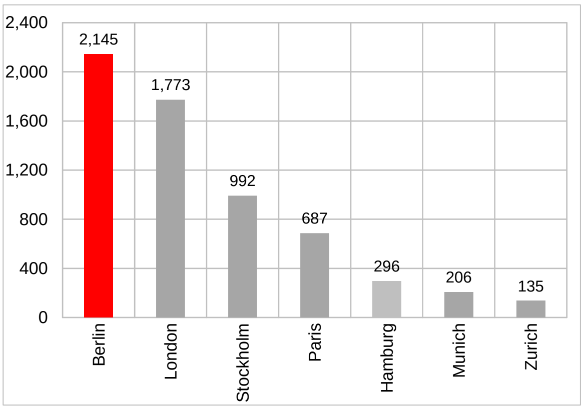


Source: Ernst & Young.

IBB Beteiligungsgesellschaft is particularly active in Berlin:

- Since 1997 with Venture-Capital, VC Fonds Technologie and VC Fonds Kreativwirtschaft
- In 2015, financing with a volume of 17.3m EUR, with partners totalling 127.2m EUR
- Since it was founded in 1997, more than 1bn EUR, Germany's most active investment company, key role in Berlin's development as a centre for start-ups
- In 2015, another 100m EUR added, 50m EUR from the European Fund for Regional Development (EFRD) and 50m EUR from IBB
- Currently invested in 75 companies with 2,485 jobs

Fig. 13: Volume of start-up financing in Europe in 2015 (in m EUR)



Source: Ernst & Young.

8.4. Recommendations for Berlin

In order to directly support the fintech sector, it makes sense to **strengthen the science hub**. Up to now, there has been only limited collaboration between fintechs and universities, with solutions being largely developed at companies themselves (in-house). At international level, however, especially in Silicon Valley, there is strong co-operation between science and industry. The most recent initiative by Berlin's Senate, i.e. to boost the number of IT chairs at universities, could help to expand co-operation with academia.

Start-up activities, also by fintechs, can be specifically promoted by **making venture capital available**. Starting a company goes hand in hand with enormous uncertainty and considerable entrepreneurial risk. At the same time, the need for financing is high. This means that access to venture capital is an important aspect when potential founders are considering whether or not to actually start up a business.

An efficient, effective, fintech-friendly **administration and infrastructure** could also act as a catalyst. Fintechs very often recruit staff from abroad and this often means additional requirements, for instance, with regard to work permits or the need to speak German. The administration (e.g. public agencies and authorities) as well as municipal companies (such as BVG transport) could take on a pioneering role by accepting new payment methods.

Measures designed to facilitate the **transfer of know-how** could also prove to be helpful. Technology-based developments, which are about inspiration ("what's possible?") and speed ("who has the ability to be the first mover?"), depend heavily on permanent exchange and interaction between the groups involved as demonstrated so successfully by experience in Silicon Valley. In Berlin, measures to help facilitate the transfer of know-how could range from providing subsidised office space to setting up a free wifi network throughout the city and even to organising events (such as innovation labs and hackathons).

For fintechs, the security and trustworthiness of the services offered by them is of paramount importance. This means, for instance, that measures designed to **combat cybercrime** could be particularly helpful. At a local level, this could involve promoting application-orientated research in security or avoiding data misuse in the public administration.

Appendix

Business field	Business model	Examples	Customers benefits	Estimated market prospects
1) Payments	▪ Practical and user-friendly payments systems where banks are only active in the background ▪ Including mobile payment systems or P2P transfers	▪ PayPal (US) ▪ ApplePay (US) ▪ M-Pesa (Kenya) ▪ Transferwise (UK) ▪ Venmo (US)	▪ Sometimes high when added value can be seen (user-friendliness). ▪ Mobile payments are gaining ground, but there are some problems.	▪ High. ▪ PayPal is one success story.
2) Investment management and deposits	▪ Algorithm-based analysis of financial behaviour and investment possibilities ("algo-banking" and "robo-advisers"). ▪ Related brokering, typically ETFs. ▪ Easy-to-open and manage deposit accounts.	▪ Mint (US) ▪ Wealthfront (US) ▪ Nutmeg (UK) ▪ Vaamo (DE) ▪ Weltsparen (DE)	▪ Sometimes high. ▪ Direct access to various financial instruments at low cost.	▪ Rather high. ▪ Especially in terms of passively managed funds.
3) Lending	▪ Lending without the involvement of a bank. ▪ P2P lending and crowd investing.	▪ Kickstarter (US) ▪ Seedmatch (DE) ▪ Kreditech (DE)	▪ Access to capital that would not otherwise be possible. ▪ Sometimes much higher costs for borrowers.	▪ Rather low. ▪ Banks' considerable experience in lending and in assessing creditworthiness. ▪ Bank license required in Germany (supervised by the Federal Financial Supervisory Authority or ECB, resp.).
4) Insurance companies (insurtech).	▪ P2P insurance ▪ Usage-driven insurance models ▪ Situation-specific short-term insurance	▪ Friendsurance (DE) ▪ Knip (CH) ▪ ZhongAn Insurance (CN) ▪ Oscar (US)	▪ Sometimes high. ▪ Contract easy to conclude. ▪ Many services but only brokered.	▪ Rather high. ▪ Market gaps, but insurance companies have already implemented some approaches.

Fig. 14: Overview of selected Fintech hubs outside Germany

Hub	**Hub characteristics**	**Successful/known fintechs**	**Number of fintechs in KPMG's top 100 fintech list**	**Position in the Global Financial Centres Index (2016)**
London	▪ Financial centre ▪ Capital readily available ▪ Government support	Funding Circle[41], Nutmeg, TransferWise, WorldRemit	15	1
New York	▪ Financial centre ▪ Capital readily available ▪ Fintech hub	Betterment, Moven, Oscar, Venmo	7	2
San Francisco/ Palo Alto	▪ Finance and technology centre ▪ Fintech pioneer ▪ Investor with experience in fintech investments	Lending Club[42], SoFi[43], Square, Stripe	18	8
Sydney	▪ Government support ▪ Strong (financial) services industry ▪ Australia's IT centre	Avoka, Equitise, Prospa, SocietyOne	7	17
Singapore	▪ Financial centre ▪ Very well trained workforce ▪ Strong government support	Fastacash, Homepay, M-DAQ, Numoni	2	3
Stockholm	▪ Population with an affinity for technology, country considered to be an "early adopter" ▪ Deregulated financial sector ▪ "Co-operative" conditions in society and work	Bima, Cinnober, iZettle[44], Klarna	2	37
Tel Aviv	▪ Considerable expertise in finance ▪ International networking and presence of foreign companies ▪ Very well trained workforce	BillGuard, Blender, eToro[45],Personetics	5	25

Sources: KPMG and H2 Ventures, Z/Yen Group Global Financial Centres Index.

[41] Funding Circle is considered by KPMG and H2 Ventures to be a fintech based in the USA. However, it is based in London.

[42] Lending Club is currently viewed critically following its poor share price development, suspected unfair commercial practices and change in CEO, but is still counted as one of the most well-known US fintechs.

[43] SoFi (Social Finance) is known in Germany as the new employer of former Deutsche Bank boss Anshu Jain.

[44] iZettle is considered by KPMG and H2 Ventures to be a fintech based in the United Kingdom. However, it is based in Stockholm.

[45] eToro is considered by KPMG and H2 Ventures to be a fintech based in the United Kingdom. However, it is based in Tel Aviv.

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