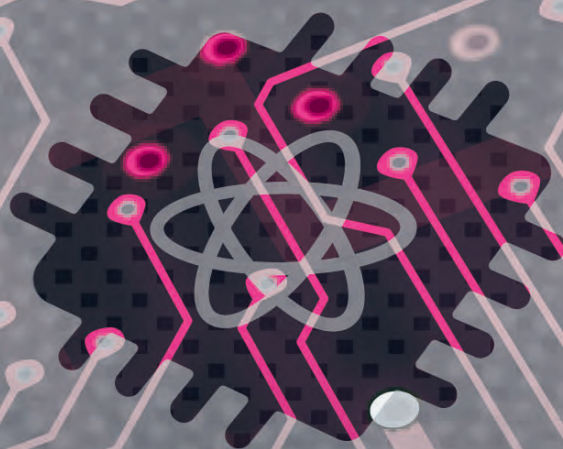


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IFZ FinTech Study 2019

An Overview of Swiss FinTech

Editors Prof. Dr. Thomas Ankenbrand, Prof. Dr. Andreas Dietrich, Denis Bieri

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1. Preface

FinTech companies are increasingly becoming an integral part of the financial industry. By providing innovative solutions, they are able to support established financial institutions in their digital transformation. After years of steady growth, the growth rate of the Swiss FinTech sector accelerated significantly in 2018, not only in terms of the total amount of companies but also in terms of the venture capital invested. As of the end of 2018, there were a total of 356 FinTech companies in Switzerland, corresponding to a growth rate of 62 percent compared to the year 2017. Also, the maturation of the sector observed in the previous year, measured by the average number of full-time equivalents and the average capitalisation of Swiss FinTech companies, continued in 2018. The increasing maturity of FinTech companies in combination with their promising internationally oriented business models could make FinTech solutions the key for the Swiss financial industry to survive the digital evolution.

This fourth edition of the IFZ-FinTech study aims to show the developments in the FinTech sector in 2018 and to re-evaluate the trends observed in our previous studies. In contrast to last year's study, this edition contains two major innovations. Firstly, we include a secondary categorisation system, the FinTech grid. The grid allows for an alternative classification of FinTech companies based on a company's product orientation and the solution's technological backbone. The second innovation comprises the analysis of the FinTech ecosystem and corresponding companies not only on a national but also on a global level. Specifically, for the first time, this study includes an analysis of the global FinTech ecosystem based on the PEST-approach as well as an assessment of companies considered to be leaders in the sector. In addition to these two innovations, the study deals with the question of how banks position themselves towards FinTech. On the one hand, the CIO Barometer survey presents information about the current trends and developments in the IT departments of Swiss banks. On the other hand, an analysis of the annual reports of banks seeks to capture the perceived importance of digitalisation and FinTech in the banking industry.

The chapters 2 to 8 cover the main part of this study. Chapter 2 provides a definition of the term "FinTech" and presents the framework of the subsequent analysis of the Swiss FinTech ecosystem. In chapter 3, the global FinTech environment is examined with the help of the PEST-approach, followed by a FinTech hub comparison. Chapter 4 gives an overview of the characteristics of 403 worldwide leading FinTech companies. Chapter 5 is dedicated to the Swiss FinTech sector and, in line with chapter 3, examines the political/legal, economic, social, and technological environment on a national level. The subsequent chapter 6 focuses on analysing the Swiss FinTech sector on a company level. The analysis is based on a proprietary database, sourced from publicly available data and a survey conducted in the Swiss FinTech sector, and provides some insights into the business models of Swiss FinTech companies and their most pressing challenges. In addition, the relevant developments, as well as an outlook on all of the FinTech product areas are summarised. The second last chapter from the main part, chapter 7, takes a look at how banks position themselves towards digitalisation, innovation, and FinTech. Chapter 8 contains the conclusion of the study and is followed by chapter 9, which includes the factsheets of the 149 Swiss FinTech companies that participated in the survey. The factsheets present the business models of the participating companies, including information such as their value propositions, market orientation, and resources.

We would like to take this opportunity to thank all parties who have contributed to the fourth edition of the IFZ FinTech study. A very special thanks goes to our sponsors Finnova, Inventx, SIX, Swiss Bankers Prepaid Services, and Swisscom for their financial and content-related support. We would also like to express our appreciation for the effort all the participants invested in our survey. Finally yet importantly, a special thanks goes to all the authors for their important contribution to this study.



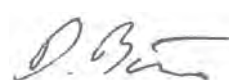
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2. Definition & Framework of the FinTech Ecosystem

By Prof. Dr. Thomas Ankenbrand & Denis Bieri,
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In this chapter, the definitions and frameworks applied in this study are described. Firstly, the term “FinTech” and its six product areas are defined. We also introduce an alternative classification framework of FinTech in which we distinguish between the product areas of FinTech solutions and their underlying technology. Secondly, the PEST-approach, which serves as a framework for analysing the general factors of the FinTech ecosystem, is explained. Sections 2.3 and 2.4 cover the methodologies focused on structuring FinTech business models and capturing current challenges in the sector.

2.1. Definition of FinTech

The renowned *Oxford Dictionary* defines FinTech as “computer programs and other technology used to support or enable banking and financial services” (*Oxford Dictionary*, online). This definition of the term “FinTech” is similar to the definition applied in this year’s IFZ FinTech study, which, in order to stay consistent, remains the same as in the previous editions, and reads as follows:

FinTech is defined as software solutions for innovative products, services, and processes in the financial industry, improving, complementing, and/or disrupting existing offerings. Hence, FinTech companies are firms whose main activities, core competencies, and/or strategic focus lie in developing those solutions.

In comparison to the definition from the *Oxford Dictionary*, our definition does not only focus on the technological aspect of FinTech and the financial sector as its target industry, but also highlights the innovative nature of FinTech solutions. This requirement of having some degree of innovation leads to a somewhat blurred distinction between FinTech solutions and other software solutions in the financial industry. Comparison and information platforms, for example, are excluded from this study due to the lack of innovation from a technological point of view. In addition to the solutions with only a small amount of innovative power, this study also excludes technological solutions focusing on the insurance and real estate industry, i.e. InsurTech and PropTech solutions. One exemption hereof are crowdfunding platforms for real estate, which constitute an alternative to the traditional real estate investment and are thus clearly linked to the financial industry. On the other hand, companies providing compliance solutions, so called “RegTechs”, are included in this study if their business model mainly targets the financial sector.

In contrast to other definitions of FinTech companies, the definition applied in this study differs in two main aspects. First, we also include incumbents that qualify under our definition of FinTech. Second, the start-up definition isn’t as narrow as, for instance, in the *Swiss Startup Radar 2018/2019* report from Kyora et al. (2018), in which start-ups are defined by the following characteristics:

- International distribution
- Focus on innovation
- Ambitious growth plans
- Scalable business model
- Science- and technology-based approach
- Professional investors

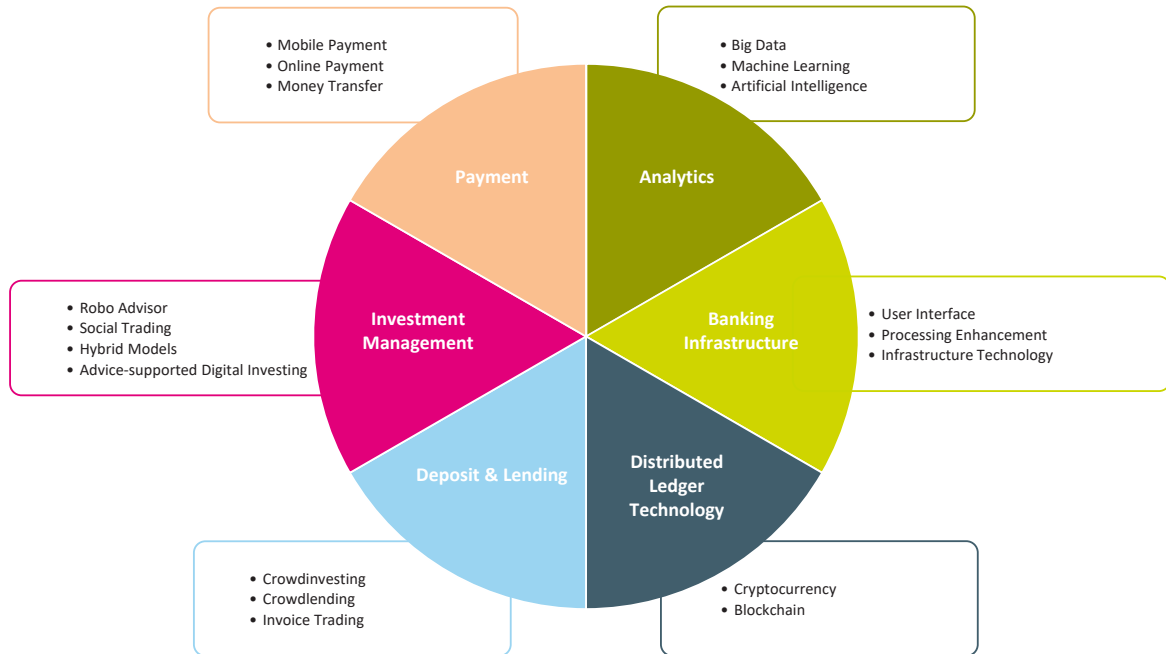


Figure 2.1: Taxonomy of FinTech business models

Our definition of FinTech companies does not impose any of these restrictions. However, we only include companies that were legally incorporated in Switzerland as of the end of 2018.

Analogous to our previous studies, our taxonomy illustrated in Figure 2.1 again distinguishes between six different main categories of FinTech, i.e. *Analytics*, *Banking Infrastructure*, *Distributed Ledger Technology*, *Deposit & Lending*, *Investment Management*, and *Payment*, which again are subdivided into multiple subcategories. In last year's edition of the IFZ FinTech study the product area *Banking Infrastructure* contained a somewhat arbitrary list of subcategories based on the business models observed in the Swiss FinTech sector. In this year's study we have come up with a new definition of *Banking Infrastructure* (see section 6.4 for more details) which includes FinTech solutions concerning the user interface, processing enhancement, and infrastructure technology.

One issue we encountered with this taxonomy of FinTech is the fusion of use case- and technology-driven

aspects of FinTech, as described in our definition. In particular, the product areas *Banking Infrastructure*, *Deposit & Lending*, *Investment Management*, and *Payment* have a clear focus on providing alternative or improving existing banking processes and products, whereas *Analytics* and *Distributed Ledger Technology* take a technology-driven view. This has led to some problems in classifying individual companies into one of the six categories. A robo-advisor using Artificial Intelligence could be an example hereof, since it could either be classified as a company in the field of *Investment Management* or *Analytics*. This issue led us to the development of a secondary taxonomy of FinTech, shown in Figure 2.2, which takes into account the two main aspects of FinTech, i.e. the use case and the technology orientation. With this framework, each FinTech company can now be evaluated based on these two dimensions.

The use case orientation is illustrated on the horizontal axis of Figure 2.2, including the product areas *Payment*, *Deposit & Lending*, *Investment Management*, and *Banking Infrastructure*. The technological dimension on the vertical axis consists of four different cat-

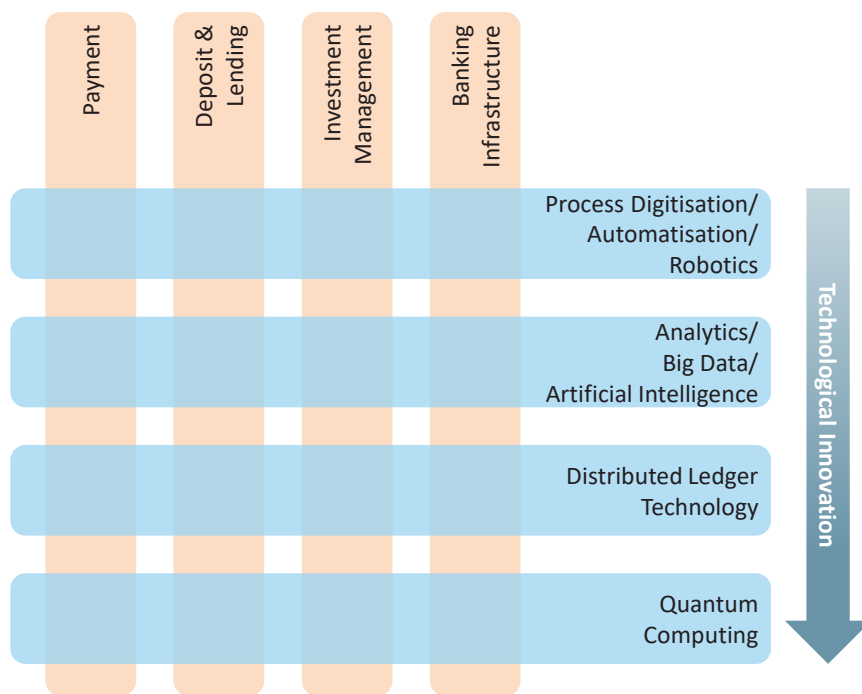


Figure 2.2: FinTech grid

egories, i.e. *Process Digitisation/Automatisation/Robotics*, *Analytics/Big Data/Artificial Intelligence*, *Distributed Ledger Technology*, and *Quantum Computing*. The order indicates the degree of technological innovation and maturity. Note that in this framework and in contrast to the primary taxonomy, *Analytics* and *Distributed Ledger Technology* are classified as technological innovation, along with two other newly added technological specifications, rather than as specific product areas. The secondary taxonomy also allows to reflect the efficiency gains related to cognitive automation to some extent. Robotic Process Automation (RPA), for example, is part of the first layer, whereas applications with self-learning or optimisation capabilities are part of the second layer.

In order to guarantee comparability to the previous editions of the IFZ FinTech study, we will primarily apply our traditional taxonomy of FinTech in our empirical analysis in chapter 4 and 6. However, we will also make use of the secondary taxonomy, i.e. the “FinTech grid”, wherever it offers additional and relevant insights.

2.2. PEST-Approach

The PEST-approach, sometimes also known as STEP-approach, is a simple analytical tool to evaluate the environment of a single company or a sector as a whole. PEST is an acronym for the four underlying *political*, *economic*, *social*, and *technological* dimensions. The political dimension consists of all political and legal factors relevant to the FinTech sector such as, for example, the regulatory framework. The economic dimension covers all determinants of an economy that directly impact the business of a company or the sector as a whole. Examples hereof are the size of the target market but also the availability of financing sources. The social dimension focuses on the social environment, with relevant factors such as the talent and media environment. Finally, the technological dimension includes the technological innovations that may affect the business of a company or an industry.

The PEST-approach provides the methodological foundation of chapter 3 and 5, in which both the global and the Swiss FinTech ecosystems are evaluated respectively.

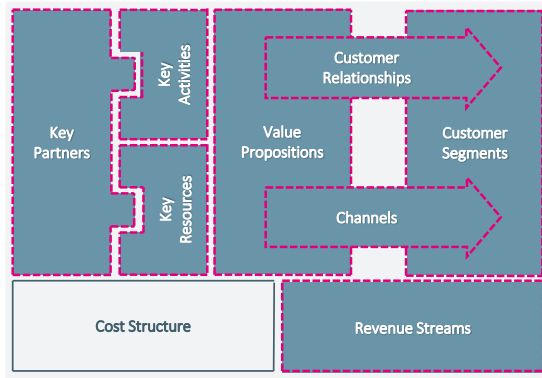


Figure 2.3: Business Model Canvas based on Osterwalder and Pigneur (2010)

2.3. Business Model Canvas

The empirical analysis of this study is based on the Business Model Canvas from Osterwalder and Pigneur (2010), which is a widely used tool for evaluating a company's business model in a structured way. It consists of nine different building blocks, as shown in Figure 2.3, which serve as a core framework for the survey conducted among the Swiss FinTech companies and for the structure of the company factsheets listed in chapter 9. The cost structure of a company's business model is the only building block that is not considered in this study, since it is closely linked to the two building blocks on the production side of a business model, i.e. a company's key activities and its key resources. The remaining eight building blocks, i.e. *key partners*, *key activities*, *key resources*, *the value propositions*, *customer relationships*, *channels*, *customer segments*, and *revenue streams*, are explained in further detail in Appendix A.

For the analysis of the FinTech companies in chapter 4 and 6, comprehensive desk research of publicly available sources was conducted based on the relevant eight building blocks, in order to shed some light on their business models. For the empirical analysis of the Swiss FinTech sector in chapter 6, we additionally conducted a survey among all the Swiss companies that qualify under the definition in section 2.1. In particular, representatives of every in-scope company were asked to correct inaccurate information gathered on their business model and to provide missing entries.

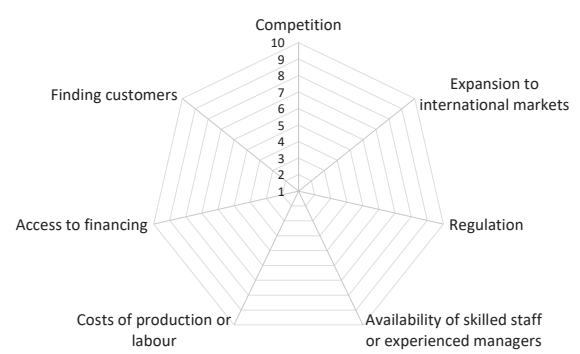


Figure 2.4: Sentiment analysis spider

2.4. Sentiment Analysis of FinTech Companies

Besides the verification and completion of the information on their business models, all the Swiss FinTech companies were asked to indicate how pressing certain pre-defined challenges are for their business on a scale of 1 (not pressing) to 10 (extremely pressing). As shown in Figure 2.4, this sentiment questionnaire included seven challenges regarding competition, expansion to international markets, regulation, availability of skilled staff or experienced managers, costs of production or labour, access to financing, and finding customers. It is based on a survey by the European Central Bank which evaluates the same challenges, excluding the one regarding international expansion, for small and medium-sized enterprises as well as large firms in the euro area (European Central Bank, 2018).

3. The Global FinTech Environment

In this chapter, the FinTech environment is described on a global scale by applying the PEST-approach described in section 2.2. This is done on a qualitative, and with regard to the hub ranking, on a quantitative level.

3.1. Political & Legal Environment

By Daniel Haerberli, Dr. Benedikt Maurenbrecher & Dr. Urs Meier, Attorneys-at-Law, Homburger AG

Understanding the applicant regulatory framework is a critical factor for FinTech companies in order to comprehend what activities can be undertaken without becoming a regulated entity, or, conversely whether regulatory authorisations or licenses are required. This section focuses on regulatory requirements and developments in the FinTech area, taking into account developments in multiple jurisdictions.

3.1.1. Distributed Ledger Technology in Finance – Switzerland’s Regulatory Approach

The Federal Council, i.e. Switzerland’s federal government, considers Distributed Ledger Technology (DLT) to be a potentially promising development in digitalisation. Therefore, it intends to further improve Swiss regulation, in order to seize opportunities and to secure the country’s current position as one of the leading hubs in the area of DLT.

On December 14, 2018, the Federal Council published a detailed report regarding the framework for DLT and blockchain in Switzerland, with a particular focus on the financial sector (DLT Report).¹ The primary goals of the DLT Report are on the one hand to provide an overview of the current legislation and on the other hand to identify legislative need for action. Additionally, the DLT Report in particular also intends to show that Switzerland is open to technological developments and that the federal government is determined to further improve the country’s already relatively innovation-friendly regulations.

Various jurisdictions worldwide are currently considering whether or how innovations in the field of DLT

may be incorporated in their legal system. Liechtenstein for example issued a consultation report on the planned “Blockchain Act” already in August 2018. The consultation period regarding this draft legislation ended in November 2018 and the new act might enter into force already in the course of 2019.²

Switzerland too is actively evaluating how innovations based on DLT and blockchain may be integrated in the legal framework. The regulatory approach now chosen by the Federal Council differs from Liechtenstein’s approach insofar as there are no plans for a dedicated Swiss “Blockchain Act”. Instead, specific amendments shall further improve the already relatively well-suited legal framework. Targeted amendments shall consolidate Switzerland’s position as a leading jurisdiction not only for DLT companies but FinTech and innovative companies in general.

The Swiss federal government instructed the competent federal departments to prepare a consultation draft in Q1 2019. With regard to Swiss financial market law, the Federal Council did not identify a need to fundamentally change the current framework. However, the consultation draft will likely cover amongst others the following elements, which may – if adopted by the Swiss lawmaker – become relevant for FinTech companies:

Trading Facilities: Under current Swiss law, three categories of trading facilities exist: (i) stock exchanges, (ii) multilateral trading facilities (MTFs), and (iii) organised trading facilities (OTFs) (see section 5.1.3.2). Due to various reasons, these categories are unsuitable for trading facilities involving crypto-based assets:

- Under current regulation, stock exchanges and MTFs must for example ensure that they are able to cancel, alter or rectify transactions in certain situations.³ Depending on the design and functionalities of the relevant DLT systems, it may be impossible to comply with such duties, for example because the validation of transfers occurs without the involvement of the operator of the trading facility or because the entries in the ledger are not reversible and may therefore not be “rectified”.

¹ See Federal Council (2018a). The report is available in German, French, Italian, and English.

² See Government of the Principality of Liechtenstein (2018).

³ Article 30 (2) (f) FMIO.

- Another reason why today's categories of trading facilities are unsuitable is that for example "retail clients" may currently not have direct access to stock exchanges or MTFs. Instead, these so-called trading venues are currently only open to holders of a securities dealer license and certain other regulated participants.⁴

Amongst others due to such issues, the Federal Council proposes a new license category for trading categories involving crypto-based assets. Under this new license, all sorts of tokens, i.e. payment tokens⁵, utility tokens⁶ as well as asset tokens⁷, shall be tradable. Furthermore, trading such crypto-based assets shall be able to operate multilaterally and in accordance with non-discretionary rules and it should encompass both tokens qualifying as securities under Swiss law (see section 5.1.3.2) and other tokens not qualifying as securities. Additionally, all processes shall be able to be performed purely digitally.⁸ The duties applicable to trading of "traditional" securities, for example with regard to anti-money laundering or market conduct, shall also apply, if the tokens traded qualify as securities, which is often the case if the tokens are asset tokens. Furthermore, given that unregulated "retail clients" shall have direct access to the trading facilities, some of the duties, which are currently performed by the regulated participants (e.g. securities dealers) of a trading venue, would in the future need to be fulfilled by the operator of the trading facility, i.e. the holder of the newly introduced license. Also, the Federal Council announced that it wants to check whether separate licenses shall be issued for OTFs (currently, an OTF may only be operated by holders of a bank, securities dealer or trading venue license) and whether holders of a so-called FinTech license (see section 5.1.1.1) shall be allowed to operate OTFs.

These amendments aim at allowing non-banks/non-securities dealers to operate trading facilities for crypto-based assets.

Insolvency: Tokens are often stored by third parties, for example wallet providers or operators of trading facilities. Under current Swiss law, it is unclear whether such digital assets can be segregated if the third party, i.e. the custodian, goes bankrupt. The Federal Council therefore plans to clarify this question in an amendment to the Swiss insolvency law as well as in an amendment to the corresponding banking regulation. Additionally, the Swiss federal government indicated that the segregation of digital data in general shall also be addressed in the legislative process. However, the Federal Council pointed out that there is no intention to introduce a "data ownership" or similar concept to Swiss law.

Collective Investment Schemes: By mid-2019 a draft law for the introduction of so-called limited qualified investment funds (L-QIFs) will be prepared. This new fund category shall be open to qualified investors and it shall not be subject to approvals, therefore allowing market participants to issue innovative funds faster and more cost efficiently than today.

Anti-Money Laundering: The DLT Report points out that there is a risk that crypto-based assets are misused for money laundering and terrorist financing. However, the Federal Council concluded that the current Swiss anti-money laundering regime already covers most of the relevant activities relating to such assets (e.g. operating a trading platform on which payment tokens can be bought and sold), since they usually qualify as financial intermediation and are hence subject to Swiss anti-money laundering regula-

⁴ Article 34 (2) FMIA.

⁵ According to the definition used by FINMA, payment tokens ("pure" cryptocurrencies, e.g. Bitcoin and Ether) are tokens, which are intended to be used, now or in the future, as (i) means of payment for acquiring goods or services, or (ii) means of money or value transfer. Payment tokens do, according to the likely predominant view in legal writing as well as according to the views of FINMA and of the Swiss federal government, not give rise to any claims against an issuer or a third party.

⁶ According to the definition used by FINMA, utility tokens are tokens that, at the point of issue, provide digital access to an application or service by means of a blockchain-based infrastructure.

⁷ According to the definition used by FINMA, asset tokens are tokens, which represent an asset, for example an equity or debt claim, against the issuer or a membership right in the corporate law sense. In the DLT Report Swiss federal government describes asset tokens similarly: "Unlike pure payment tokens, [asset tokens] represent real economic assets "outside" the blockchain. In particular, an asset token may consist of a claim against the issuer under contract law or a membership right according to corporate law. For example, some asset tokens promise a share of future company earnings or future capital flows. Depending on its economic function, a token can thus represent a share, a bond or a derivative financial instrument." (Federal Council, 2018a, p. 83).

⁸ See Federal Council (2018a, p. 108).

tion (see section 5.1.3.6). Challenges continue to exist in particular with regard to so-called non-custodian wallet providers and decentralised trading platforms, however, according to the Federal Council such topics need to be addressed on an international level.

Once the consultation draft regarding the proposed amendments has been published, interested parties will be invited to submit their views and comments. Since this legislative project will not only affect DLT companies but FinTech companies in general, it is worth following the further developments closely and participating actively in the (very straightforward) consultation process.

3.1.2. Trading Asset Tokens – Big Stock Exchanges Around the World are Gearing Up

To date, token trading platforms are the domain of largely unregulated exchanges.⁹ However, with the arrival of asset tokens¹⁰, “traditional” stock exchanges worldwide are gearing up to new opportunities. In particular, institutional investors such as banks and securities dealers will likely opt to cooperate with fully regulated exchanges that adhere to the highest institutional standards and best practices. Therefore, amongst others¹¹ the following big players are moving into position:

- **USA:** The Intercontinental Exchange, the owner of the New York Stock Exchange (NYSE), announced plans to develop and launch “Bakkt”, an exchange for digital assets, in early 2019.¹²
- **Singapore:** The Singapore Exchange (SGX) and the Monetary Authority of Singapore (MAS) announced in November 2018 that Delivery versus Payment capabilities for digital assets have been successfully

developed, which demonstrated that financial institutions and corporate investors are able to carry out the simultaneous exchange and final settlement of tokenised assets and securities assets on different blockchain platforms.¹³

- **Switzerland:** Switzerland’s stock exchange (SIX) is building the “SIX Digital Exchange (SDX)”, which shall offer a “fully integrated end-to-end trading, settlement and custody service” for digital assets. The rollout is planned for mid-2019. The platform will enable trades, clearing, settlement, and custody carried out in one stroke. It will in particular also include a new form of tokenised share, which shall allow companies to more easily raise capital and allow smaller firms to more easily access the capital market.¹⁴

Amongst others, the following reasons explain why traditional stock exchanges are gearing up for an anticipated wave of asset token trading:

- DLT promises efficiencies, which may allow processes such as trading, clearing, and settlement to occur in a faster and more cost-effective way. The identification and validation of transactions, which today require rather complicated and expensive centralised infrastructures, might in the future be carried out cheaper and in a decentralised way.
- At present, access to the capital market is generally reserved for large companies. DLT might enable small and mid-sized companies (SMEs) to issue and trade securities with reduced financing costs. In particular, if traditional financial instruments such as bonds and shares are issued in a tokenised form, SMEs might gain direct access to the capital market and could probably raise funds for their operations more easily. This could in turn also create increased

⁹ Currently, the ten largest global exchanges control around 70 percent of daily trading volume in tokens (crypto assets).

¹⁰ See footnote 7.

¹¹ Shanghai, London, Frankfurt, Australia, the United Arab Emirates, Bangkok, Malta, and Gibraltar are also among those in the race to upgrade at least parts of their trading services with DLT.

¹² See Bakkt (online).

¹³ See media release of the Monetary Authority of Singapore (2018).

¹⁴ See SIX (online (a)).

trading volumes, which would also benefit banks, securities dealers, and asset managers deriving fees from such trading activities.

Exchanges setting up infrastructures for asset token trading face both technical and regulatory challenges. The latter concern for example the following:¹⁵

- Disintermediation, which characterises the tokenisation of traditional financial instruments such as shares and bonds, means that some tasks currently performed by financial intermediaries will no longer be performed by such institutions in the future. Financial intermediaries are for example of particular importance in combating money laundering. If a financing process is carried out without the involvement of a financial intermediary, tasks which need to be performed in this regard will have to be carried out either by different players (e.g. the operator of the issuance platform/trading facility itself) or by using new technical solutions, which prevent issuers from becoming beneficiaries of funds of criminal origin.
- Furthermore, securities issued as asset tokens also entail new risks for investors. They may no longer rely on the judgement of financial intermediaries who today “filter” transactions and prevent dishonest issuers from accessing the capital market. Consequently, the importance of information docu-

ments such as prospectuses and the role of the regulatory bodies approving such documents will likely gain importance.

- Finally, securities issued as asset tokens also lead to new risks as far as losses, theft or insolvency scenarios are concerned. With regard to traditional intermediated securities (*Bucheffekten*), such risks are limited, since there is specific legislation protecting investors. With regard to asset tokens, such regulatory “safety nets” are yet to be developed, e.g. by clarifying under what circumstances such crypto-based assets may be segregated if a custodian goes bankrupt (see section 3.1.1).

3.2. Economic Environment

*By Prof. Dr. Thomas Ankenbrand & Denis Bieri,
Institute of Financial Services Zug IFZ*

The economic environment constitutes the second pillar of a FinTech ecosystem. In this section, a selection of global economic trends relevant for FinTech companies are described.

3.2.1. Venture Capital in FinTech

Investments into the FinTech sector are growing on a global scale. The total amount of venture capital invested into FinTech companies in the first two quar-

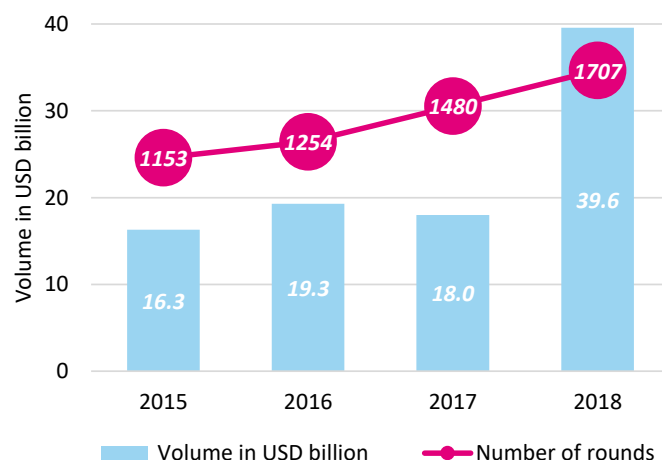


Figure 3.1: Global venture capital investments in FinTech (Source: CB Insights, 2019)

¹⁵ See also Iffland and Läser (2018).

ters of 2018 already exceeded the total volume invested over the whole year 2017 (CB Insights, 2019). Figure 3.1 illustrates the total number of venture capital deals in FinTech per year and the corresponding investment volumes on a global scale.

The year 2018 saw 1,707 FinTech-related venture capital deals with a total volume of USD 39.6 billion, representing an increase in the investment volume of 120 percent compared to roughly USD 18 billion in the year 2017. However, this significant growth is to a large extent based on the venture capital investment round of *Ant Financial* in the second quarter of 2018 with a volume of USD 14 billion. From a regional point of view and excluding the investment round of *Ant Financial*, Northern America accounted for half, Asia for one third, and Europe for 14 percent of the global venture capital investment volume in FinTech in 2018 (CB Insights, 2019). The average deal size is growing as well, particularly in Asia, where it is almost twice as large as the global average. Investors are becoming more selective and increasingly invest in proven, later-stage companies (McKinsey & Company, 2018a). This is reflected by the higher growth in investment volume compared to the number of investment rounds in Figure 3.1.

3.2.2. Initial Coin Offerings

Besides the strong growth of traditional venture capital investments, the total volume of funds raised through initial coin offerings has also been subject to an increase in total volumes. As shown in Figure 3.2, 1,072 ICOs were conducted in 2018 raising a total amount of USD 21 billion (CoinSchedule, online). Thus, the number of ICOs conducted more than doubled and the total volume raised by this alternative form of financing tripled in comparison to the year 2017. USD 5.4 billion can be attributed to projects active in the fields of finance, trading & investing, and payment, representing a share of roughly one quarter of the total volume raised in 2018 (CoinSchedule, online).

81 percent of the total volume was raised in the first half of 2018, with the months June (USD 5.8bn) and March (USD 4.5bn) accounting for the highest amounts. In these two months, the five largest ICOs of all time, i.e. *EOS* (USD 4.2bn), *Telegram* (USD

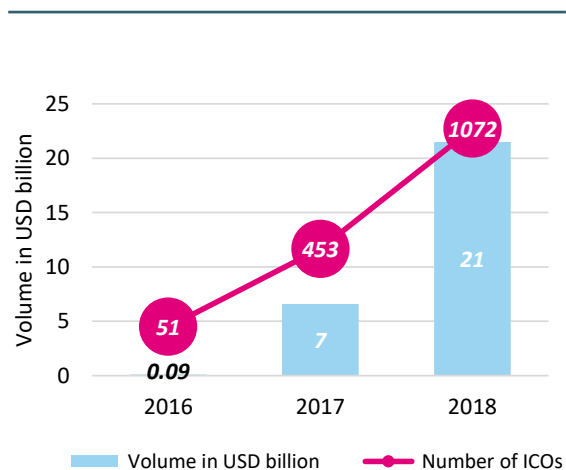


Figure 3.2: Total global ICO rounds and volumes by year (Source: CoinSchedule, online)

1.7bn), *Petro* (USD 0.74bn), *TaTaTu* (USD 0.58bn), and *Dragon* (USD 0.42bn) were closed (CoinSchedule, online). In the second half of 2018, a total amount of USD 4 billion were raised. Reasons for this decline in ICO volumes may include the general negative sentiment in the market for cryptographic assets or the increasing regulatory awareness.

Besides direct investments in cryptographic assets via initial coin offerings, indirect forms of investment such as, for example, through an investment fund, have gained ground over the past years. There are over 900 existing cryptocurrency funds, with roughly 60 percent structured as crypto-native funds, i.e. funds that focus their investments on tokenised networks, and 40 percent as traditional funds. Most of these funds were incepted in the years 2017 and 2018 and were launched in the United States (42%), followed by China (15%) and the United Kingdom (6%) (Crypto Writing Agency, 2018). *Autonomous Research LLP*, a research provider focusing on the financial industry, distinguishes between eight different types of investment strategies of crypto funds. They include liquid venture investing in tokens, cryptocurrency trading, Artificial Intelligence or quantitative analysis funds, token baskets, passive crypto-indexes, traditional funds of funds, credit funds, and ecosystem funds from software platforms (Autonomous, 2018a).

A more detailed description of the main crypto fund strategies is given in Table 3.1, along with the respective value drivers.

3.2.3. Market Size and Business Environment

A competitive and sizable domestic financial industry is an important factor for the emergence of a FinTech sector. This especially holds true for FinTech companies in the Business-to-Business area, which are targeting established financial institutions as potential customers. The *Global Financial Centre Index (GFCI)*, an index published on a half-yearly basis by *Z/Yen Partners* in collaboration with the *China Development Institute*, is an often-cited ranking that measures the competitiveness of financial centres around the globe. Since competitive traditional financial hubs imply a certain pool of potential customers, they constitute fertile ground for the development of a sizable FinTech sector. According to the September 2018 edition of the *GFCI*, the top ten financial centres globally include – in ranking order – New York, London, Hong Kong, Singapore, Shanghai, Tokyo, Sydney, Beijing, Zurich, and Frankfurt. From a regional point of view, six are located in the Asia-Pacific region, three in Europe, and one in Northern America. Just over five years ago, in September 2013, the Asia-Pacific region and Europe

accounted for four cities each and Northern America for two. The emergence of financial centres in the Asia-Pacific region is not only identified by the shift observed in the *GFCI*, but also when looking at the development of the share of the value added by a country's financial industry to its total national income. Figure 3.3 shows the temporal development of these shares for all countries (which publish the respective information) represented in the top ten of the *GFCI*. It reveals that the shares of value added by the financial sector on the total national income for the countries from Europe, i.e. Germany, Great Britain, and Switzerland show a falling tendency. The opposite holds true for two of the three countries in the Asia-Pacific area, with China showing the largest growth rate among all countries represented in the top ten of the *GFCI*.

Another important factor besides the competitiveness of the financial industry of a country is the favourability of its business environment. The annual *Doing Business Report* by *The World Bank* is a well-cited publication in this regard. The report consolidates multiple business factors such as the ease of starting a business or getting credit into a ranking of 190 countries (The World Bank, 2018). According to the report issued for the year 2018, the most favoura-

| Strategy | Description of Strategy | Value Drivers |
|-----------------|--|--|
| Liquid Venture | Apply early stage technology pattern matching skills to recognise crypto projects that could be the next generation of web infrastructure | <ul style="list-style-type: none"> – Market size & team – Token design – Long-term holding period |
| Trading | Treat crypto as any other asset class, like commodities or equities, and trade long or short positions | <ul style="list-style-type: none"> – Liquidity, technical trading – Short-medium term holding period |
| AI/Quant | Use statistical models or machine learning to generate alpha through arbitrage or factor analysis, with quant methods generalised from other markets | <ul style="list-style-type: none"> – Large data sets – Test large numbers of alpha hypotheses |
| Token Baskets | Manager selection or aggregation projects that provide a single token representing several managers or investments | <ul style="list-style-type: none"> – Quality of underlying managers – Counterparty risk |
| Index Funds | Several emerging packages of small, mid and large cap cryptocurrencies for asset allocation | <ul style="list-style-type: none"> – Passive beta exposure to the asset class – Selection criteria |
| Fund of Funds | Traditional fund of funds packaging of crypto funds that use hedge fund structures | <ul style="list-style-type: none"> – Quality of underlying managers – Two layers of fees |
| Credit Funds | Investment advisors that invest in crypto lending assets from networks | <ul style="list-style-type: none"> – Underwriting risk modeling and loan selection |
| Ecosystem Funds | Investment into projects that build on top of the investor's technology or use an internal product or service | <ul style="list-style-type: none"> – Growth of ecosystem – Use of protocol/exchange |

Table 3.1: Strategies of crypto funds (Source: Autonomous, 2018a)

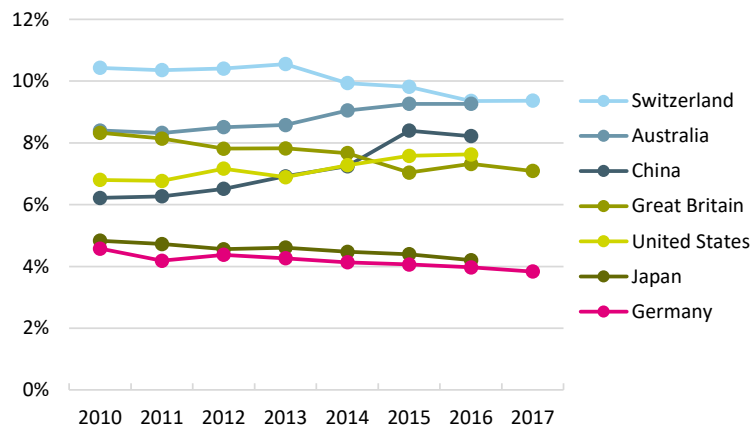


Figure 3.3: Value added by the financial industry for selected countries, in % of national income (Source: OECD, online)¹⁶

ble business environments can be found in the Asian-Pacific area, with New Zealand (1), Singapore (2), Hong Kong SAR (4), and South Korea (5) accounting for four of the top five countries, the only exception being Denmark on rank three. The top ten is completed by four European countries, i.e. Georgia (6), Norway (7), the United Kingdom (9), and Macedonia FYR (10) and the United States on rank eight (The World Bank, 2018).

3.3. Social Environment

By Prof. Dr. Thomas Ankenbrand & Denis Bieri,
Institute of Financial Services Zug IFZ

The social environment plays an important role not only for the production side of a FinTech sector, with relevant factors such as the availability of talent, but also for the adoption of respective solutions.

The FinTech industry, as the innovative spearhead of digital banking, is dependent on skilled labour in order to provide innovative, technology-driven solutions. The capability to develop, attract, and retain talent therefore constitutes a crucial factor for sustainable growth in the FinTech sector. The *IMD World Talent Ranking* by the *IMD* business school is an an-

nual report that evaluates these capabilities for various countries. It consolidates various factors relating to the resources committed to cultivate home-grown talent, to the attractiveness of a location for local and foreign talent, and to the quality of the skills and competencies of the resident work force (IMD, 2018). The *IMD World Talent Ranking 2018* states that the majority of countries with leading talent competitiveness are located in Western Europe. With Switzerland (rank 1), Denmark (2), Norway (3), Austria (4), the Netherlands (5), Finland (7), Sweden (8), Luxembourg (9), and Germany (10), nine of the ranking's top ten countries are located in said area, the only exception being Canada on rank 6. The strong performance of Western European countries is based on their capabilities of cultivating home-grown talent (IMD, 2018). The presence of a pool of talent is an important requirement for the innovative power of an industry. Consequently, it does not come as a surprise that according to the *Global Innovation Index 2018* report by the *Cornell University*, *INSEAD*, and the *World Intellectual Property Organization*, the most innovative countries are predominantly located in Europe. The annual report, which was published for the first time in 2007, ranks Switzerland at the first position, followed by the Netherlands, Sweden, the United Kingdom, Singapore, the United States, Finland, Denmark, Germany, and Ireland on posi-

¹⁶ For Australia, China, Japan, and the United States, the figures for the year 2017 were not available at the point of writing.

tions two to ten (Cornell University et al., 2018). Hence, Singapore and the United States on positions five and six, respectively, are the only two exceptions in the otherwise Europe-dominated top ten leading innovative countries.

A further aspect of the social environment includes the quality of the entrepreneurial ecosystem required to facilitate the development and the implementation of innovative solutions. This includes not only the attitude towards entrepreneurship of a society, but also entrepreneurial abilities and aspirations (Ács et al., 2018). Figure 3.4 shows the number of start-ups founded since 2014 per 10,000 capita (left axis) along with the absolute number of start-ups founded over the same period for selected countries (right axis) as a measurement of entrepreneurial activity.

It reveals that in relative terms, Singapore has witnessed the largest amount of start-up foundations per 10,000 capita of all countries in Figure 3.4, followed by Israel, Switzerland, the United States, and the United Kingdom (Crunchbase, online). In absolute terms, the United States outperformed all other countries by far with more than 37,000 start-up foundations between 2014 and the end of 2018. With roughly 7,700 and 7,100 start-up foundations respectively, India and the United Kingdom exhibit the second and third largest amount (Crunchbase, online). These figures are partially in line with the findings of the *Global Entrepreneurship Index* by Ács et al. (2018). According to the index, which measures both the quality of entrepreneurship in a country and the extent and depth of the supporting entrepreneurial ecosystem,

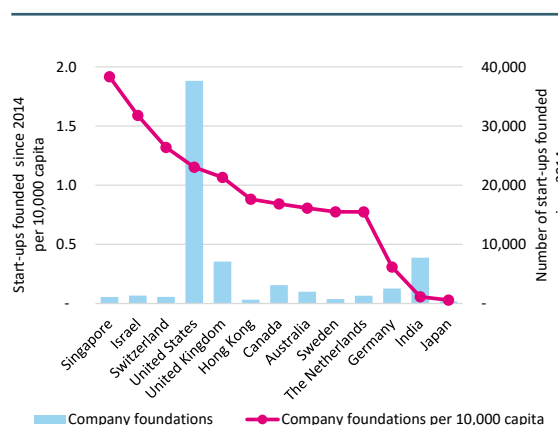


Figure 3.4: Start-ups founded since 2014 (Sources: Crunchbase, online; United Nations Population Division, online)

the United States, Switzerland, Canada, the United Kingdom, and Australia take the leading positions. Singapore and Israel, the two countries with the highest number of start-up foundations per 10,000 capita, on the other hand are located on rank 27 and 16, respectively (Ács et al., 2018).

Besides the production perspective for FinTech solutions, the environment for adoption plays an important role. In the evaluation of the economic environment in section 3.2, the competitiveness of a countries' financial sector was argued to be an important factor for FinTech companies targeting other financial institutions as potential customers. In the Business-to-Customer (B2C) area, i.e. for FinTech companies targeting private individuals, a facilitator for the adoption of FinTech-related solutions, for example in the field of mobile payment or mobile banking, is the availability of mobile devices. Figure 3.5 shows the number of mobile cellular subscriptions per 100 capita by region for the years 2012 and 2017, as a proxy for the market penetration of mobile devices.

It reveals that by the end of 2012, the two regions Europe & Central Asia and Latin America & the Caribbean had the highest number of mobile cellular subscriptions per 100 capita. Whereas Europe & Central Asia were able to retain their shares at a high level, Latin America & the Caribbean have witnessed a slight decrease with their second position being overtaken by the East Asia & Pacific region, whose share increased by 30 percent from 2012 to 2017. Besides the East Asia & Pacific region, the regions South Asia (+28%), Sub-Saharan Africa (+27%), and North

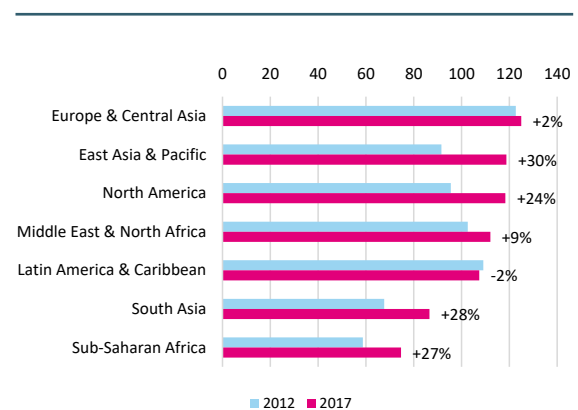


Figure 3.5: Mobile cellular subscriptions per 100 capita (Source: The World Bank, online)

America (+24%) also increased their share significantly from 2012 to 2017. By the end of 2017, North America exhibited the third largest amount of mobile cellular subscriptions, i.e. 118 per 100 capita, whereas South Asia and Sub-Saharan Africa still had a relatively low market penetration despite large growth rates. The high market penetration indicates that the potential for FinTech adoption, especially in the B2C area, seem to be highest, at least from a mobile penetration point of view, for countries in Europe, Central and East Asia, the Pacific region, and Northern America. From a demographic point of view, the smartphone penetration, as well as the internet usage is higher for younger than for older generations.¹⁷ This tech-savviness combined with the redefined sentiment towards financial services with decreasing trust in existing financial services providers following the most recent financial crisis has led to the highest adoption rate for FinTech solutions among people between the age of 25 to 34 (Ernst & Young, 2017). On the other hand, these so called “millennials” have lower real incomes and have accumulated fewer assets than members of earlier generations when they

were at a similar age, as shown in a recent publication by Kurz et al. (2018). This circumstance represents a challenge to FinTech companies, especially in the B2C segment, since it impedes the generation of sufficient business volumes, despite high adoption rates.

3.4. Technological Environment

By Prof. Dr. Thomas Ankenbrand,
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Technological innovation is crucial for driving a nation’s economic growth (Romer, 1990). The endogenous growth model, developed among others by Paul Romer, who received the *Nobel Memorial Prize in Economic Sciences* in 2018 together with William Nordhaus (The Royal Swedish Academy of Sciences, 2018), highlights the importance of technological innovation. The development and potential of emerging technologies to support this innovation can be illustrated with the *Gartner’s Hype Cycle*, as shown in Figure 3.6. The current expectations held for a technology are shown

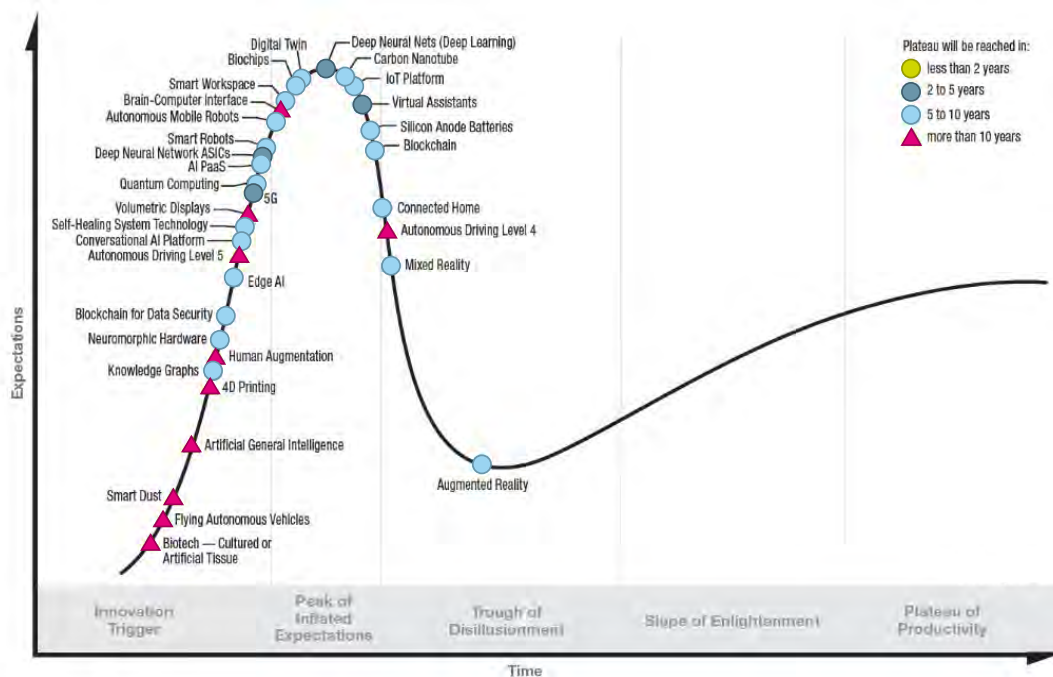


Figure 3.6: Hype cycle for emerging technologies (Source: Panetta, 2018)

¹⁷ See, for example, Deloitte (2017a) or Pew Research Center (2018) for the smartphone penetration or internet usage for US citizens, respectively.

in relation to time, thus identifying the stage of the cycle a technology is in, and when the plateau is expected to be reached.

According to Panetta (2018), the new technologies can be organised into democratised Artificial Intelligence (AI), digitalised ecosystems, do-it-yourself biohacking, transparently immersive experiences, and ubiquitous infrastructure. Panetta allocates a number of specific technologies to each of these five trends:

- **Democratised Artificial Intelligence:** AI Platforms-as-a-Service (PaaS), autonomous driving, autonomous mobile robots, conversational AI platforms, deep neural nets, flying autonomous vehicles, smart robots, and virtual assistants
- **Digitalised ecosystems:** DLT, digital twin, Internet of Things (IoT), and knowledge graphs
- **Do-it-yourself biohacking:** Biochips, biotech (cultured or artificial tissue), brain-computer interface, exoskeletons, augmented reality, mixed reality, and smart fabrics
- **Transparently immersive experiences:** 4D printing, connected home, edge AI, self-healing system technology, silicon anode batteries, smart dust, smart workspace, and volumetric displays
- **Ubiquitous infrastructure:** 5G, carbon nanotube, deep neural network application-specific integrated circuits (ASICs), neuromorphic hardware, and quantum computing (Panetta, 2018).

Though the technologies have the potential to apply to a wide spectrum of use cases, it must be noted that not all of the above-mentioned technologies hold the same degree of relevance for the financial industry.

Cloud computing, AI, DLT, and quantum computing (despite its very early stage of development) currently stand out in the area of FinTech. These four emerging technologies are, in theory, interconnected and mutually reinforce each other due to their different capabilities. More specifically, quantum computing, once fully developed and applicable, could be able to provide new hardware, DLT a new database, AI new data analysing technology, and cloud computing new business or platform models for the financial industry. The concept of this interconnectedness and reinforcement potential between the four technologies is illustrated in Figure 3.7.

Computing power and sufficient data volumes are necessary conditions for Artificial Intelligence systems to be enabled to reach significant results. These two requirements can be met with the help of cloud infrastructures, which offer scalable computing power and data storage capacity. This advantage offered by cloud computing could potentially solve the problem of the saturation posed according to Moore's Law, by employing parallel and scalable hardware infrastructures. Providers such as *IBM Watson* and *Amazon Web Services* already offer complete AI Plat-

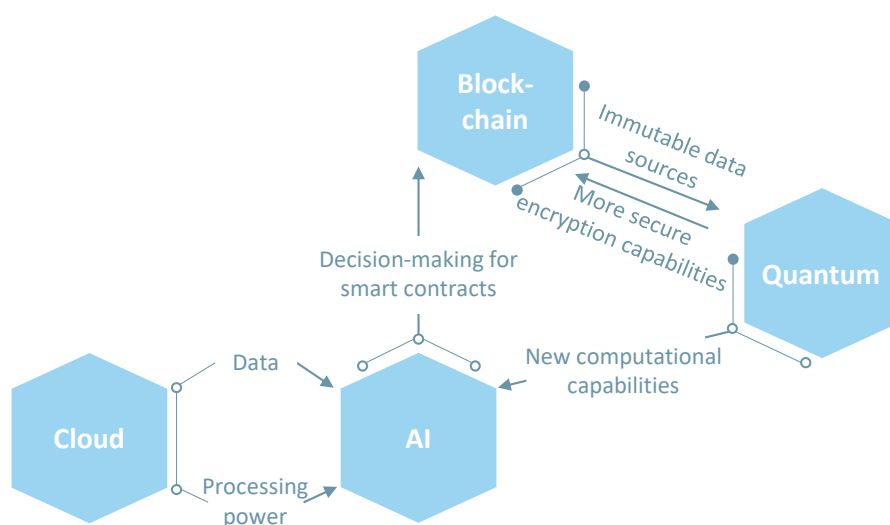


Figure 3.7: Emerging technologies of FinTech (Source: McWaters & Galaski, 2018)

forms-as-a-Service (PaaS). These platforms allow to build scalable solutions with flexible costs, as well as low fixed costs. The reinforcing capabilities of computing power and data storage could perhaps be a reason why Artificial Intelligence has experienced a resurgence since the first bout of scientific research in the 1950s and the two boom and bust cycles in the late 1970s and early 1990s. In addition, cloud solutions do not only offer processing power and data storage, but a network too. 7.5 billion people and 20 billion smart computing devices are connected to the cloud. It is expected that the number of Internet-of-Things (IoT) devices will grow to 30 billion up until 2020 (Autonomous, 2018b; McWaters & Galaski, 2018).

Artificial Intelligence is becoming more and more mainstream. 83 percent of the top tier banks consider using, and more than two-thirds already apply AI in their business. Contrary to what may initially be assumed, the main goal of AI is not to replace human intelligence, but rather to enhance it. As computers can detect patterns and correlations in huge amounts of data, AI is able to build its own knowledge extracted from the data and act in accordance with it. An interaction between these applications of AI and human intelligence could be defined as augmented intelligence. One problem that remains with AI however, is that the decisions made cannot necessarily be explained or traced back. This could be problematic in some cases of implementation. The General Data Protection Regulation (GDPR), for example, foresees the right of the client to demand an explanation as to why the algorithm made a certain decision (Squirro, 2018). As the decisions pass through a black box, the decisions made by AI cannot necessarily be defended.

By acting on three levers, AI could help the financial industry save more than USD 1 trillion by 2030. The first lever constitutes the cost reduction, enabled by shifting tasks from humans to computers. Though not every automation process needs AI, with the help of it even the more complex tasks could be dealt with by machines. The second lever is the risk mitigation achieved by reducing credit and operational risk through, for example, improved loan underwriting or fraud detection with machine learning. The increasing revenue generated through improved effectiveness, better customer relationship management and enhanced customer experience is the third lever (Fin-

technews Singapore, 2018). The successful application is not characterised by completely new modelling approaches or the most complex algorithms, but rather in the combination of advanced analytics and relevant data sources with existing business fundamentals (McKinsey & Company, 2018a).

Quantum computing, as a further emerging technology relevant for the area of FinTech, could shift the frontiers of computing power in terms of speed and complexity of certain types of algorithms. However, its development remains at an early stage. The full impact of quantum computing is probably still more than a decade away. Nevertheless, in companies such as *IBM*, *Google*, *Rigetti Computing*, *Alibaba*, *Microsoft*, and *Intel*, research is fully underway. Quantum computers are built based on the pioneering ideas of physicists Richard Feynman and David Deutsch. In line with their idea, quantum computing is not built on bits that are either zero or one, but contains qubits that can be overlays of zeros and ones. In addition, qubits do not exist in isolation, but become entangled and can act as a group. These two properties allow qubits to achieve a higher degree of information density than classical computers. On the flip side, however, qubits are prone to errors. Though it is possible to correct these errors, this overhead makes the scaling of quantum computers difficult in reality. Potential use cases are, for example, Artificial Intelligence, cybersecurity, logistics, and simulation in the industries of chemistry, pharmaceuticals, energy, and finance. Specifically for the financial industry, promising areas of application are trading strategies, portfolio optimisation, asset pricing, risk analysis, fraud detection, and market simulation (Gerbert & Ruess, 2018).

DLT or blockchain allows to store data or for smart contracts to be distributed without any form of central control (McWaters & Galaski, 2018). Furthermore, the DLT is the underlying technology for the existence of cryptographic tokens. At the end of 2018, there were over 2,000 different cryptographic tokens which were either based on their own blockchain, known as native tokens, or on another chain like the frequently used *ERC20* tokens on the Ethereum blockchain, known as non-native tokens (CoinMarketCap, online). Cryptographic assets, blockchain and DLT have prominently featured in the news and media and have been debated among communities, industry practitioners, and policymakers. To better understand the different implementations, it is helpful to think of the

DLT structure as multiple layers. There are three layers: the protocol layer, the network layer, and the data layer (Rauchs et al., 2018). Applications, for example, could be placed on the top of these three layers. A framework of how different types of cryptographic assets can be defined is given by Autonomous (2018a). In this framework, which is illustrated in Figure 3.8, cryptographic assets are categorised into General Monetary Instruments, Application Utility Tokens, and Tokenized Financial Instruments. General Monetary Instruments (coloured in magenta) are classed as cryptographic assets, which resemble currencies, with examples being various types of coins or protocol tokens. The second category, Application Utility Token, is coloured light blue in Figure 3.8 and seeks to group together cryptographic assets which can be defined as utility tokens sourced from ICOs or smart contracts. The final category is coloured dark blue in the taxonomy illustration and identifies cryptographic assets, which bundle together existing and emerging financial instruments that are delivered in a tokenised form using Distributed Ledger Technology. Some cells in Figure 3.8 show a second colour

next to them, indicating the alternative category it could be assigned to (Autonomous, 2018a).

Besides AI, DLT, cloud and quantum computing other new technologies and business models have the potential to influence the financial industry. New ecosystems like *Uber* or *Airbnb* do not only reorganise the product offering and delivery, but also seamlessly integrate the payment process. This reduces the relevance of traditional financial services providers significantly for the customer. With the help of IoT platforms, machines will start to transact autonomously without human interaction. Combined with AI they will be able to make smarter transactions, implying that, in the near future, the customer will have access to intelligent robots or virtual assistants. The inter-human communication will shift more and more towards a machine-to-machine communication, at least in the transaction-oriented space. The interconnected and digitalised ecosystems will lead to new platform business models. One concrete reaction from the financial industry are open banking platforms. A disruptive approach offered by DLT is where both the platform

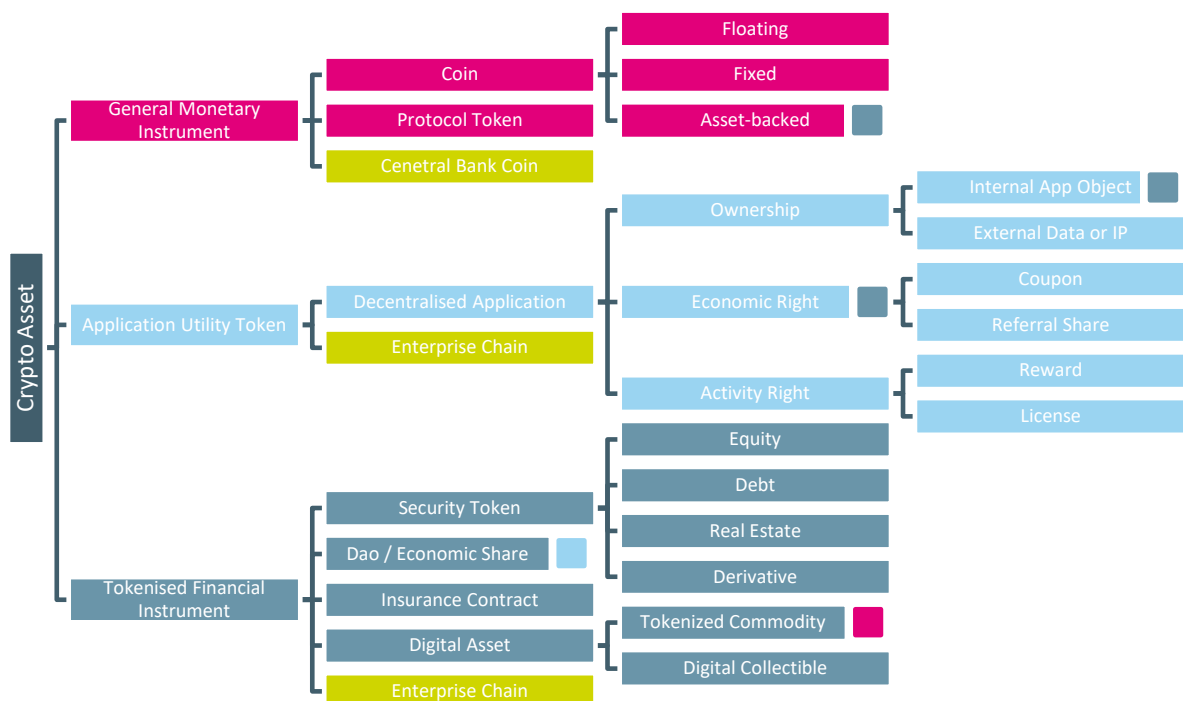


Figure 3.8: Token taxonomy (Source: Autonomous, 2018a)

and ecosystem are self-organised and decentralised without a central provider, at least in theory.

Gartner (2018) states that 80 percent of heritage financial service firms will be irrelevant by 2030. The reason behind this is digitalisation. Global digital platforms, FinTech companies and other non-traditional players are able to gain market share because they use the new technology and adapt the business models better. Three types can be identified, which will survive: First, power-law firms which own a digital platform and use the scalable, low-cost infrastructure and customer data to generate new services or enter new markets. Second, FinTech companies which offer pure-play/neobank offerings and disaggregate traditional financial services. Third, long tail firms which are able to offer services at lower costs.

3.5. FinTech Hub Comparison

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In this section, the continuation of the FinTech hub ranking introduced in our second last edition of the IFZ FinTech study is made.

3.5.1. Initial Situation

In 2018, different articles on evaluating the performance of FinTech hubs were published. The *Global Fintech Hub Index* by the *Academy of Internet Finance (AIF)* of the *Zhejiang University* and the *Cambridge Centre for Alternative Finance (CCAF)* of the *University of Cambridge*, for example, derives a ranking of global cities by taking into account the performance of the FinTech industry, the FinTech consumer experience, and the FinTech ecosystem. The report identifies seven global FinTech hubs. Four of these hubs are located in China (Beijing, Shanghai, Hangzhou, and Shenzhen), two in the United States (San Francisco and New York), and one in the United Kingdom (London). The report also includes the two Swiss cities, Geneva and Zurich. Whereas Zurich is labelled as a regional hub on ranking position 29, Geneva is classi-

fied as an emerging Fintech hub along with 24 other cities (AIF & CCAF, 2018). Contrary to our ranking methodology described in the next section, the methodology of the *Global FinTech Hub Index* includes general factors of a FinTech ecosystem such as the national GDP, but also output factors such as the number of leading FinTech companies in a region.

3.5.2. Ranking Framework

Based on feedback from multiple sources, this year's hub ranking includes three more cities in addition, namely Seoul (South Korea), Santiago de Chile (Chile), and Tallinn (Estonia). Also, the indicators *University Education*, *Talent Environment*, *Demographics*, *Compulsory Education Quality*, *Openness*, and *Proclivity to Attracting Talent*, which are part of the *Global Talent Index Report*, were excluded due to the lack of current data. Apart from the extension of the number of cities included to 33 and the reduction of the number of considered indicators to 66, the ranking methodology remains unchanged in order to provide comparability to the ranking results of the two previous editions of the IFZ FinTech study.¹⁸ The ranking methodology is therefore once again based on the PEST-approach and is conducted in four steps. Firstly, each of the 66 performance indicators is categorised into one of the four PEST-dimensions according to its affiliation.¹⁹

Second, for each indicator, an individual ranking of all 33 in-scope cities is derived, resulting in 66 individual scores ranging from 1, the city with the worst performance, and 33, the city with the best performance. In a third step, four sub-ranking scores on a PEST-dimension level are calculated for each in-scope city by simply averaging the underlying indicator rankings. Due to this proceeding, the PEST-dimension scores are again bound between 1, only reached by the city that performs worst in every indicator ranking and 33, only reached by a city that performs best in every indicator ranking. In a fourth step, the PEST-dimension scores are aggregated for every in-scope city, implying an equal weighting of each of the four dimensions. The final FinTech hub ranking is then derived by sorting the cities in descending order.

¹⁸ See Ankenbrand et al. (2017) for an in-depth discussion of the ranking methodology.

¹⁹ See Appendix B for a detailed listing of the indicators and their classification into the four PEST-dimensions.

3.5.3. FinTech Hub Ranking

As shown in Figure 3.9, the top six positions of the ranking remain unchanged in a year-to-year comparison, with Singapore taking the leading position again. Being ranked on positions two and three, the two Swiss cities Zurich and Geneva offer very favourable conditions for FinTech companies to thrive. London, Amsterdam, and Toronto are positioned on positions four to six, respectively.

As in the previous year's ranking, the top ten are completed by New York City, San Francisco, Hong Kong, and Stockholm, however, with switched positions. Whereas the two US cities and Hong Kong each climbed one position in the ranking, Stockholm lost

three positions from rank seven in the previous year to rank ten in this year's ranking. Note that the distance between these four cities, as measured by the total score of the ranking, is only marginal. Switches in ranks are thus not expressive and need to be interpreted with caution. The three cities Seoul, Tallinn, and Santiago de Chile, which have been newly included in the ranking, appear on rank 18, 21, and 29, respectively.

Figure 3.10 shows the ranks of the top ten cities on the PEST-dimension level and the corresponding year-to-year changes in order to explore the performances of the hubs in more depth. The two Swiss cities are highlighted in magenta.

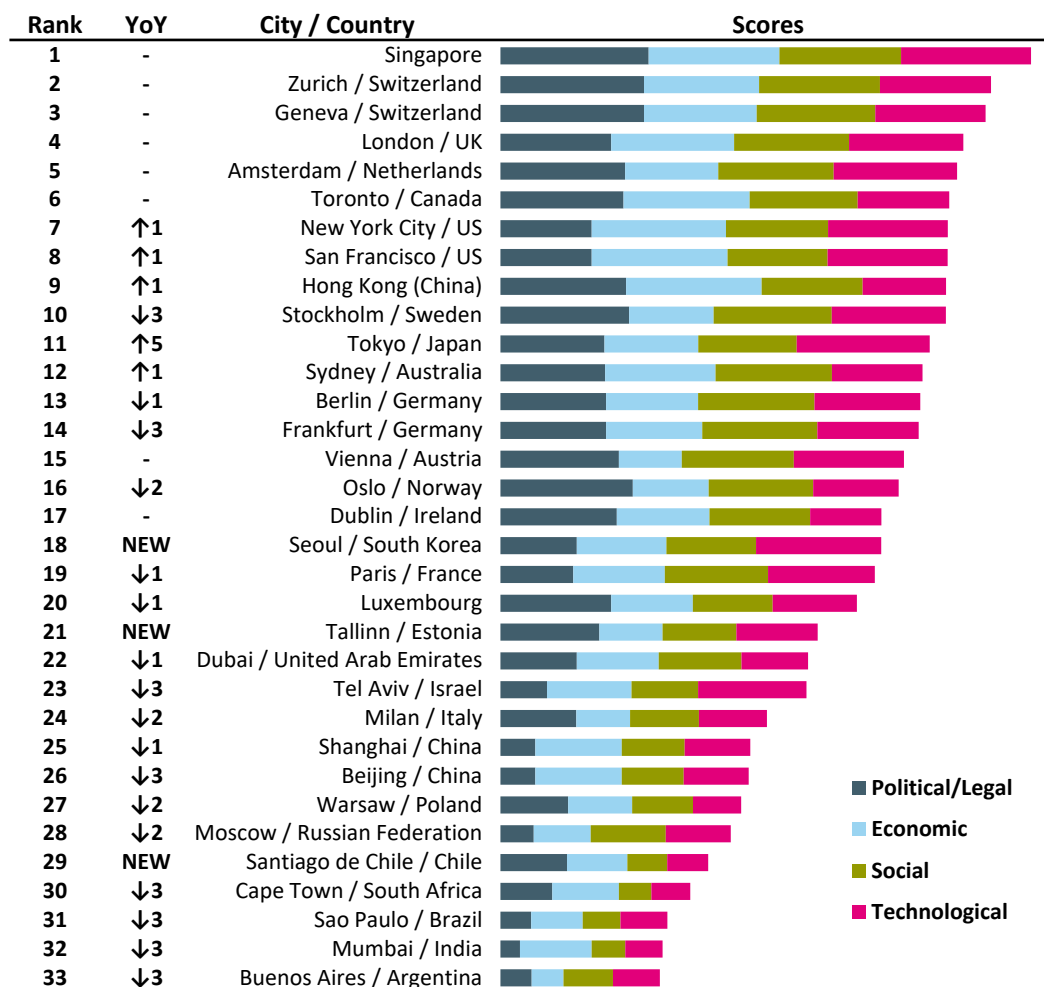


Figure 3.9: FinTech hub ranking

Zurich and Geneva both reveal the second best political and legal environment, only outperformed by Singapore that takes over the leading position from the two Swiss cities. Singapore, Zurich, and Geneva base their leading positions on their political stability, high regulatory quality and relatively high government effectiveness. In the economic dimension, Zurich and Geneva retain their seventh and eighth rank, respectively, with the relatively small market size and the high wage levels preventing a better ranking. San Francisco finishes on the top of the respective dimensional ranking, taking over the first place from Hong Kong. Looking at the social factors, the two Swiss cities perform well, as in last year's ranking, with Zurich retaining its second place and Geneva climbing one position to rank three. The outstanding performance of the two Swiss cities in social regard builds on the exceptional talent environment with globally leading universities, its highly skilled labour force, and the high quality of life. Zurich and Geneva are only outperformed by Singapore which climbed ten positions in a year-to-year comparison. This strong increase is partially based on the ranking methodology, since Singa-

pore was excluded in some social indicators in which it performed comparably bad in the last year. The technological dimension is led by Tokyo, followed by Singapore and Seoul. Zurich and Geneva rank on positions nine and ten, implying an ascent of one and two position in comparison to last year's evaluation. The strengths of both cities in the technological dimension include the high degree of university and industry collaboration and the intense ICT-use of the Swiss population, whereas weaknesses include low levels of government online services and e-participation.

Overall, the environment surrounding the Swiss FinTech sector is in an excellent condition, especially in the political/legal and social regard, although the former has witnessed a slight deterioration in comparison to last year's ranking. On the other hand, there is still some room for improvement in the economic and technological dimension. The increased performance in the technological dimension in comparison to last year's ranking shows that Switzerland is on the right track to retain or, ideally, expand its significant role as a global FinTech hub.

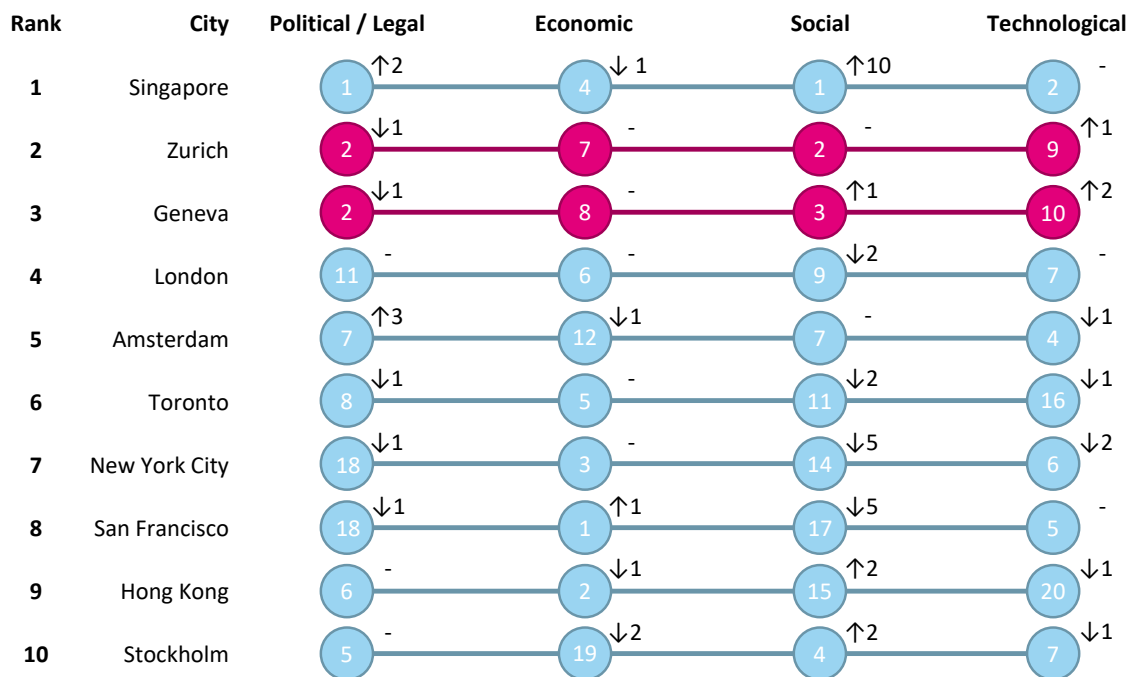


Figure 3.10: PEST-dimension rankings and year-on-year changes

4. Global FinTech Companies

By Prof. Dr. Thomas Ankenbrand & Cyrill Schönenberger,
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This chapter aims to give an overview of international FinTech companies. The analysis presented in this chapter is based on four international FinTech rankings by *CB Insights* (CB Insights, 2018a), *Forbes* (Forbes, 2018), *KPMG and H2* (KPMG & H2, 2018), and *IDC* (IDC, 2018). While *KPMG and H2*, and *IDC* rank the top 100 FinTech companies, *Forbes* classifies the top 50 and *CB Insights* the top 250.²⁰ These rankings provide a data sample, including companies which may not necessarily fall exactly into the definition proposed in section 2.1. The absence of a universal definition becomes apparent when merging the data samples, as only a few duplicates are found among the different rankings. In line with the other parts of the study, companies in the field of insurance were omitted. Additionally, *Paytm*, *Orchard*, and *Dovetail* were excluded as they were acquired by or are a product of *One97 Communications*, *Kabbage*, and *Fiserv*, respectively. Following the mentioned adjustments, the sample consists of 403 companies.

After having cleansed the data, comprehensive desk research of publicly available sources was conducted in line with the Business Model Canvas methodology described in section 2.3. The companies were classified into the six product areas of FinTech according

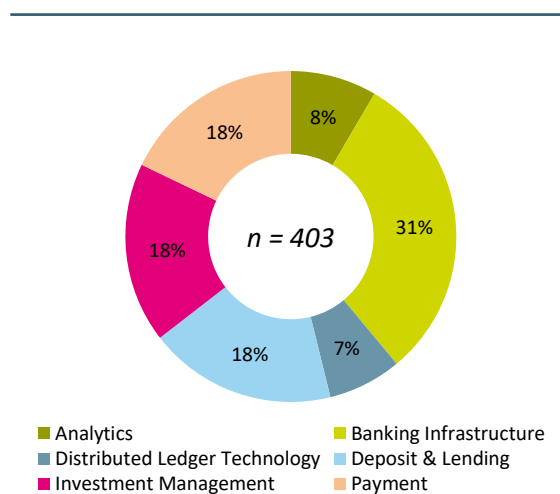


Figure 4.1: Distribution of FinTech companies in top lists (n=403)

to section 2.1, i.e. *Analytics*, *Banking Infrastructure*, *Distributed Ledger Technology*, *Deposit & Lending*, *Investment Management*, and *Payment*. In addition, the country of the headquarters, the year of inception, and the targeted customer segments were assessed. The latter consists of the subdivisions into Business-to-Customer (B2C), Business-to-Business (B2B), as well as the national or international focus.

The following sections provide a deeper insight into the results of the research. In a first step, the distribution of the FinTech companies is presented. In a second step, an overview of the incorporations and the locations of the included FinTech companies is given. Finally, the proportion of FinTech companies by customer segment is illustrated.

Of the total of 403 FinTech companies, 34 operate in the field of *Analytics*, 123 in *Banking Infrastructure*, 29 in *Distributed Ledger Technologies*, 74 in *Deposit & Lending*, 71 in *Investment Management*, and 72 in *Payment*. Hence, the field *Banking Infrastructure* includes 31 percent of all the considered FinTech companies, followed by *Deposit & Lending*, *Investment Management*, *Payment* (18% each), *Analytics* (8%), and *Distributed Ledger Technology* (7%) (see Figure 4.1).

The reason for the large percentage of *Banking Infrastructure* FinTech companies can be identified by investigating the different rankings. The *IDC* ranking consists of over 70 companies in the field of *Banking Infrastructure* and therefore affects the sample distribution accordingly.

Figure 4.2 shows the number of FinTech company incorporations per year. In 2017, a total of five companies in the field of *Distributed Ledger Technologies* were founded and listed in the rankings. Besides these, two companies in the *Deposit & Lending* category, and one each in the *Banking Infrastructure* and *Payment* category were founded in 2017 and considered in the rankings.

The number of FinTech companies shows continuous growth over the past years, with a maximum of 45 newly incorporated FinTech companies in the years 2012 and 2014. After 2015, the chart shows a significant decrease in the number of FinTech companies

²⁰ Note that contrary to the empirical analysis of the Swiss FinTech sector in Chapter 6, this chapter mainly refers to the year 2017.

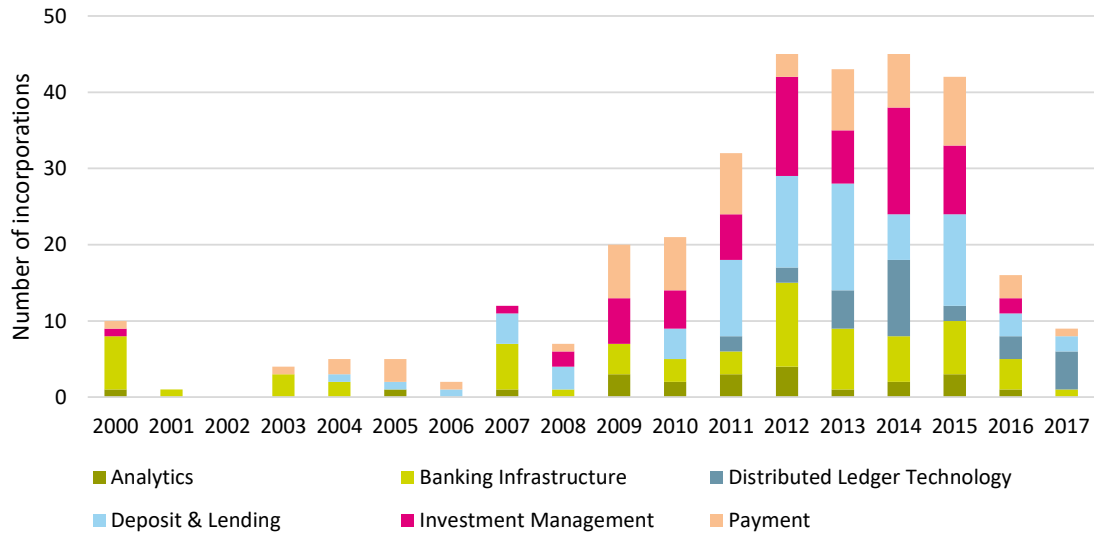


Figure 4.2: Number of FinTech company incorporations per year (n=403)

included in the four rankings. There should not be too much weight attached to this development. A lot of companies don't step into the public eye until months or years after their incorporation. Besides the funding, the development of the products takes up a lot of time, a step which escapes public attention. As only the top FinTech companies are included in the rank-

ing, the development of the firm has to be advanced in order to justify the attention. We expect a lot more companies from the years 2016 and 2017 to be included in the rankings in the next few years.

Figure 4.3 shows the number of FinTech companies by country. With 189 companies, close to 47 percent are

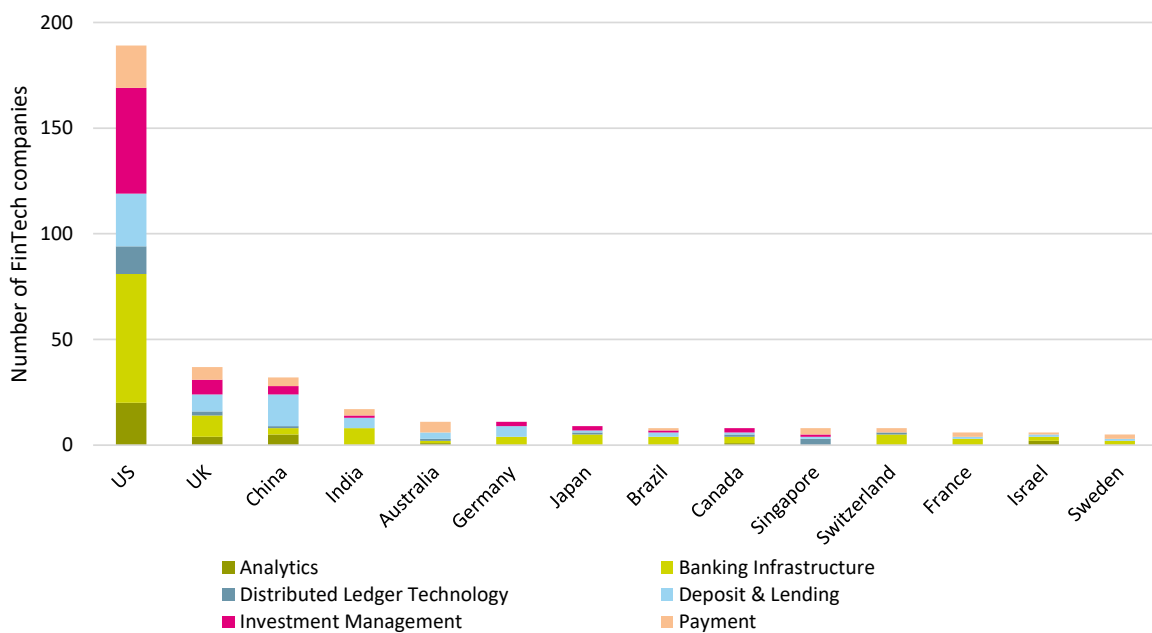


Figure 4.3: Number of FinTech companies by country (n=403)

from the United States. The second largest number of companies are located in the United Kingdom (37), followed by China (32), India (17), Australia (11), Germany (11), Japan (9), Brazil (8), Canada (8), Singapore (8), Switzerland (8), France (6), Israel (6), and Sweden (5). The remaining countries host fewer than five of the FinTech companies included in the rankings. The large number of companies from the United States may partially be attributed to a certain home bias by the rankings included in the analysis.

A possible explanation for the low number of Chinese companies could be that the Chinese FinTech ecosystem differs from that in the West. In the US, the most successful FinTech companies typically follow a disruptive strategy, whilst focusing on one area, such as, payment, lending, or wealth management. In China, the most successful FinTech companies have been tech giants, which have built financial ecosystems on the back of high-engagement consumer platforms (McKinsey & Company, 2018a). These platforms allow huge and fast scaling. China's prominent online commerce company *Alibaba*, for instance, launched a payment system known as *Alipay* and a money market fund known as

Yu'e Bao. In addition, *Alibaba* also launched a lending facility and an insurance platform (Cappgemini and LinkedIn, 2018).

Other criteria to analyse the globally leading FinTech companies are the markets targeted in terms of customer type and geographical orientation. Both factors are part of the customer segment in the Business Model Canvas. In Figure 4.4, all the possible combinations between B2B, B2C, national focus, and international focus are listed. International operations include the national business too.

Most of the FinTech companies included in the four rankings serve multiple markets or operate worldwide and, therefore, have an international orientation. These are 62 percent, expressed as a relative number. Hence, the residual 38 percent are exclusively active in their domestic market. Regarding the customers served, it can be stated that the majority of the FinTech companies serve business clients. More precisely, this is the case for 53 percent, while 28 percent only serve private individuals. This results in 19 percent of FinTech companies serving businesses, as well as private individuals.

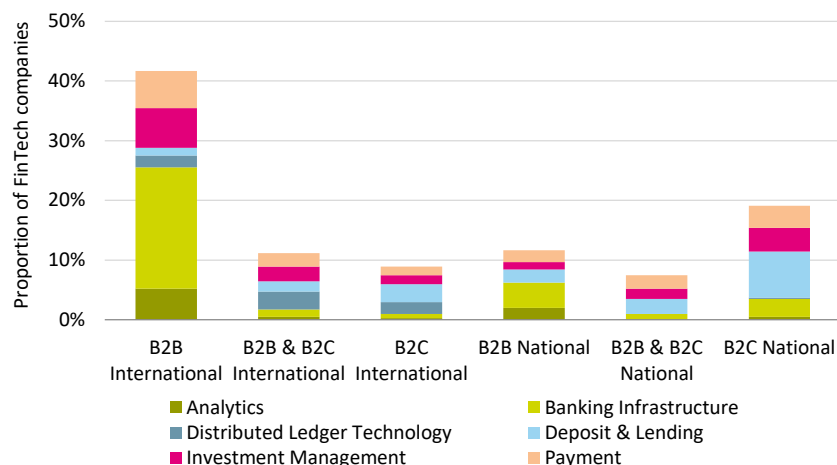


Figure 4.4: Proportion of FinTech companies by markets served (n=403)

Figure 4.4 also reveals the distribution of the markets served over the six main product areas. *Distributed Ledger Technology* (97%) shows the highest degree of international orientation followed by *Banking Infrastructure* (73%), *Analytics* (71%), *Investment Management* (61%), and *Payment* (56%). The product area *Deposit & Lending* is the only exception, with a proportion of 68 percent of its companies focusing on

the domestic market. Companies in the *Deposit & Lending* sector set a focus on individual customers whereas companies active in the field of *Analytics* (85%) and *Banking Infrastructure* (80%) predominantly target businesses as customers. FinTech companies in the *Distributed Ledger Technology* area organise their businesses to address companies, as well as individuals.

5. The Swiss FinTech Environment

Analogous to the third chapter, this chapter describes the political/legal, economic, social, and technological environment, but no longer globally, but specifically oriented towards Swiss FinTech companies.

5.1. Political & Legal Environment

By Daniel Haerberli, Dr. Benedikt Maurenbrecher & Dr. Urs Meier, Attorneys-at-Law, Homburger AG

FinTech companies need to analyse financial market regulation, in order to determine whether their activities, services or products trigger regulatory authorisation or licensing requirements.

The first part of this subchapter outlines Switzerland's FinTech specific regulation, which is in force since January 2019 (section 5.1.1). The second part then provides a high-level outlook on the new Financial Services Act ("FinSA") as well as the new Financial Institutions Act ("FinIA"), which will enter into force on January 1, 2020 (section 5.1.2). Finally, the third part outlines key elements of the current Swiss²¹ regulatory²² framework (section 5.1.3).

5.1.1. FinTech Specific Regulation

The Swiss FinTech specific regulation comprises three "pillars": (i) the so-called FinTech license, which has been available since January 1, 2019 (section 5.1.1.1) as well as (ii) the innovation area ("sandbox") (section 5.1.1.2), and (iii) the settlement account exemption (section 5.1.1.3), which already entered into force on August 1, 2017.

5.1.1.1. New FinTech License

Since January 1, 2019 the Banking Act ("BA") provides for two types of licenses: (i) the regular banking license and (ii) the newly introduced banking license "light", which is often referred to as the FinTech licence.²³

Before this new license category became available, only banks were allowed to accept deposits from the public on a professional basis or to recommend them-

selves publicly for doing so. Since generally all liabilities vis-à-vis clients qualify as *deposits* and since for example accepting deposits from more than 20 persons may already qualify as acting on a *professional basis* (see section 5.1.3.1), some FinTech companies would have required a regular banking license in order to implement their business model.

With the new FinTech license, such companies that usually do not intend to engage in the classic banking business, i.e. interest difference transactions (*Zinsdifferenzgeschäft*), now have a viable alternative. In particular for companies which are mainly active in the financial sector but which may limit their operations to accepting deposits of less than CHF 100 million and which do not need to invest these funds nor pay interest, the new license might be an attractive alternative.

However, there is a series of aspects, which need to be taken into account when considering to apply for such a FinTech license. In order to obtain a license from FINMA, which is often a lengthy and costly process, the company needs amongst others to:

- clearly define its scope of business and provide for an internal organisation, which is appropriate to its business activities
- establish an appropriate risk management system as well as an effective internal control system, which in particular ensure compliance with laws and internal rules
- have adequate financial resources (minimum of 3% of the deposits held by the company, i.e. up to CHF 3 million, but at least CHF 300,000)
- ensure that the company itself as well as the persons in charge of the company's administration and management enjoy a good reputation and safeguard proper business conduct

Once the FinTech license is granted, any deposits held by the company will need to be either (i) kept separated from the assets of the company itself or (ii) recorded in the company's books in such a way that

²¹ Regulatory frameworks of other jurisdictions are not discussed. Of course, activities in cross – border contexts and in particular internet/blockchain based activities, which generally have a global reach and often involve various jurisdictions, need to comply with applicable foreign laws and regulations as well.

²² This contribution is focused on regulatory aspects. Of course there are other legal aspects which might be relevant for FinTech related activities such as questions relating to tax law, contract law, intellectual property or data protection.

²³ See in particular article 1b BA.

they can be shown separately from the company's own funds at any time (if the company opts for the latter option, a more comprehensive audit is required).²⁴

If the maximum deposit threshold of CHF 100 million is exceeded, the company must notify FINMA within 10 days and must file a regular bank license application within 90 days.²⁵

Holders of a FinTech license are required to comprehensively inform their customers about the risks of their business model, their services, and the technologies used. Furthermore, the company's customers need to be informed about the fact that their deposits with the company are not protected by the Swiss deposit insurance regime. Solely mentioning this information in the company's general terms and conditions is insufficient and if the information is made available electronically, it must be ensured that customers may at any time view, download and save it. Also, the information must be made available prior to entering into the agreement with the customer and the customer must have enough time to understand the information prior to concluding the contract with the company.²⁶

5.1.1.2. "Sandbox" Exemption

The Swiss "sandbox" exemption created an innovation space that allows to engage in activities, which under the former regulations would have triggered bank licensing requirements. Companies accepting deposits from the public are deemed not to be acting on a commercial basis, provided

- (i) the deposits accepted do not exceed the threshold of CHF 1 million,
- (ii) the deposits accepted are neither invested nor interest-bearing, and
- (iii) the depositors are informed prior to depositing the funds that the company accepting the funds is not supervised by FINMA and that the funds are not protected by the Swiss deposit insurance regime.²⁷

If the deposit threshold of CHF 1 million is exceeded, the company must notify FINMA within 10 days and must file a regular bank license or FinTech license application within 30 days. During the interim period between the filing of the license application and FINMA's decision on the request, the other conditions still need to be met, i.e. no interest may be paid on such deposits and the information duties vis-à-vis depositors must be fulfilled. Also, FINMA may on a case by case basis decide that no further deposits may be accepted until the end of the license application process.

If the company chooses to inform its customers about the lack of FINMA supervision and the lack of deposit insurance protection via its website, certain requirements must be met. First, the information must be displayed separately from other information; therefore, solely mentioning it in the company's general terms and conditions is insufficient. Second, this information must be displayed in text and in reproducible form. Third, the company's customers need to expressly confirm that they took note of the information.

The "sandbox" exemption is designed to create a safe space, where in particular FinTech companies shall be able to test their business ideas and provide certain financial services without becoming a regulated entity under Swiss banking regulation. However, it must be noted that companies engaging in activities within the "sandbox" are still likely to be subject to anti-money laundering regulation (see section 5.1.3.6) and may therefore nonetheless need to adhere to a series of regulations. Hence, the "sandbox" should not be misunderstood as a "regulation free" area.

5.1.1.3. Settlement Accounts Exemption

Funds held in customer accounts of securities dealers, dealers of precious metals, asset managers or similar companies, which exclusively serve the purpose of settling customer transactions do not qualify as deposits and therefore do not trigger bank licensing requirements provided the funds are not interest-bearing and provided they are forwarded within a

²⁴ Article 14f BO.

²⁵ Article 1b(6) BA.

²⁶ See article 7a BO.

²⁷ Please note that this exemption will be amended by April 1, 2019. Under the revised article 6 para. 2 of the BO, companies accepting deposits from the public will be deemed not to be acting on a commercial basis if the current requirements (i) and (iii) are met and if they (ii) are not engaging in interest difference transactions, i.e. in the classic banking business (see also section 5.1.1.1). Hence, the current requirement (ii) will be replaced.

relatively short time. Under the former regulation, such funds needed to be processed within 7 days. Since August 1, 2017 the “settlement accounts exemption” allows for the funds to be processed within up to 60 days. Hence, the exemption became significantly less strict, thus facilitating the operation of funding platforms and allowing certain other business models which before were not possible without a banking license.

5.1.2. Outlook: Financial Services Act and Financial Institutions Act

On June 15, 2018 the Swiss Parliament passed the Financial Services Act (“FinSA”) and the Financial Institutions Act (“FinIA”), implementing the centrepieces of the new Swiss financial market architecture. Both acts as well as the corresponding ordinances, i.e. the Financial Services Ordinance (“FinSO”) and the Financial Institutions Ordinance (“FinIO”), will enter into force on January 1, 2020. The rollout of these new laws will have a major impact on FinTech companies and financial services providers in general.

5.1.2.1. Financial Services Act

The FinSA will impose several new requirements on financial services providers as well as implement a new prospectus regime for the offering and admission to trading of financial instruments. It largely mirrors the respective EU regulations (MiFID II, Prospectus Directive, PRIIPs), however, it is not yet clear whether the new Swiss regulation will be deemed to be equivalent to the respective EU regulations. Key elements of FinSA will be the following:

- **Client segmentation:** Under FinSA, clients will need to be subdivided into retail clients and professional clients and a different level of protection will have to be applied depending on the relevant client segment.
- **Rules of conduct:** FinSA will introduce a series of rules of conduct for financial service providers, which must be complied with when providing financial services. These are (i) duties of disclosure, (ii) duties to perform suitability and appropriateness tests, (iii) duties of documentation and accountability, and (iv) duties of transparency and due diligence.
- **Prospectus requirements:** The FinSA will introduce a new prospectus regime, which will inter alia provide for a requirement that prospectuses need to be approved *ex ante* by a new regulatory body, which will be licensed and supervised by FINMA. In principle, the requirement to publish an approved

prospectus will apply to all public offerings in or into Switzerland and to all securities that are to be admitted to trading on a trading venue in Switzerland. However, the FinSA will also contain a series of explicit exemptions for this requirement to prepare a prospectus (e.g. if the public offering is limited to professional clients or to a maximum of 500 investors).

5.1.2.2. Financial Institutions Act

The FinIA will introduce new uniform rules for the license requirements of financial institutions (portfolio managers, trustees, managers of collective assets, fund management companies and securities firms) as well as for Swiss branches or representative offices of foreign financial institutions. Under the FinIA all covered financial institutions will be subject to common core requirements that need to be met. Such requirements will largely mirror the current requirements, which must be met for example by banks and securities dealers. Financial institutions will therefore be required to have an appropriate organisation (risk management, effective internal control system, etc.). Furthermore, they will need to be effectively managed in Switzerland and both the financial institution itself as well as the persons in charge of their administration and management must enjoy a good reputation and safeguard proper business conduct. One of the key changes resulting from FinIA will be that portfolio managers (e.g. independent external asset managers) and trustees will become subject to prudential supervision. Such supervision will be conducted by an independent supervisory organisation that itself will be licensed by FINMA for this purpose. Certain other types of financial services, for example investment advice, will remain unregulated under the FinIA but will become subject to the duties under the FinSA as set out above.

5.1.3. Current Swiss Regulatory Framework

FINMA is Switzerland’s primary regulator supervising the financial market and its participants, with its regulatory powers based on the Federal Act on the Swiss Financial Market Supervisory Authority (“FINMASA”). The Swiss regulatory framework relevant for FinTech companies is in particular set out in the following federal acts and their implementing regulation:

- Banking Act (“BA”): regulating banking activities as well as the supervision of banks

- Stock Exchange Act (“SESTA”): governing the supervision of securities dealers (note: the act will be abolished upon the entry into force of the FinIA; see section 5.1.2.2)
- Financial Market Infrastructure Act (“FMIA”): governing the organisation and operation of financial market infrastructures (*inter alia*, trading venues and payment systems) and the conduct of financial market participants in securities and derivatives trading
- Anti-Money Laundering Act (“AMLA”): regulating the prevention of money laundering and terrorist financing and the due diligence in financial relationships and transactions
- Consumer Credit Act (“CCA”): governing consumer credits, i.e. loans granted on a professional basis to individuals for purposes other than business or commercial activities
- Collective Investment Schemes Act (“CISA”): governing all collective investment schemes (irrespective of their legal status), the management of such schemes, the distribution of units in collective investment schemes as well as the safekeeping and segregation of assets held in them

The following sections provide a high-level overview of the current Swiss regulatory framework applicable to banks (section 5.1.3.1), trading facilities (section 5.1.3.2), payment systems (section 5.1.3.3), securities dealers (section 5.1.3.4), asset management (section 5.1.3.5), anti-money laundering (section 5.1.3.6), consumer credits (section 5.1.3.7), and collective investment schemes (section 5.1.3.8).

5.1.3.1. Banks

Only banks and persons pursuant to article 1b BA, i.e. holders of a FinTech license (see section 5.1.1.1), are allowed to accept deposits from the public on a professional basis or to recommend themselves publicly

for doing so.²⁸ Furthermore, only licensed banks (but not mere holders of a FinTech license) may use or refer to the term “bank” or “banker” in their company name, their company purpose or in advertisement for their company.²⁹ Any unauthorised acceptance of deposits or advertising of such services may be subject to criminal punishment.³⁰

Generally, companies are considered to be banks amongst others³¹ if they

- (i) are mainly active in the financial sector; and
- (ii) accept deposits from the public in an amount higher than CHF 100 million on a professional basis or recommend themselves publicly for this purpose; or³²
- (iii) accept deposits from the public in an amount up to CHF 100 million on a professional basis or recommend themselves publicly for this purpose and reinvest them or pays interest on them.³³

A company is *active in the financial sector* if it renders or procures financial services, in particular, by engaging in the deposit or lending business, securities trading, investment or asset management for itself or for third parties.³⁴ The requirement to accept deposits from the public *on a professional basis* is generally (see “sandbox” exemption under section 5.1.1.2) met, if it (a) continuously accepts more than 20 deposits from the public or (b) recommends itself publicly for this purpose (regardless of whether the company actually continuously accepts more than 20 deposits from the public or not).³⁵

Generally all *liabilities* *vis-à-vis* clients qualify as deposits.³⁶ There are, however, a number of exemptions. Amongst others the following liabilities are exempt, i.e. are not considered deposits:³⁷

²⁸ Article 1a and 1b BA.

²⁹ Article 1(4) BA.

³⁰ Article 46 and 49 BA. Article 44 FINMASA.

³¹ Companies are considered to be banks too if they refinance themselves significantly with loans from several banks that do not own any qualified / significant shareholdings in them in order to finance any number of persons or companies with which they do not form an economic unit of their own and in any manner possible; see article 1a(c) BA.

³² Article 1a(a) BA.

³³ Article 1a(b) BA.

³⁴ Article 4(1)(a) BO. Furthermore, holding companies owning predominantly participations in companies active in the financial sector are themselves considered active in the financial sector; article 4(1)(b) BO. Finally, significant group companies (Wesentliche Gruppengesellschaften) as defined in article 3a BO are deemed to be active in the financial sector too; article 4(1)(c) BO.

³⁵ Article 6(1) BO.

³⁶ Article 5(1) BO. FINMA-Circular 2008/3 para. 10.

³⁷ Article 5(3) BO.

- funds provided in consideration of a contract providing for the transfer of property or the rendering of a service (e.g. prepayments that form part of consideration for a purchase agreement are exempt but granting a loan with a duty to repay is not exempt)
- funds which are transferred as a security
- credit balances on client accounts of securities dealers, precious metal traders, asset managers or similar companies which solely serve the purpose of the settlement of client transactions, provided no interest is paid on these funds and provided they are forwarded within 60 days
- funds that to a small extent are fed into a payment instrument or a payment system and that are exclusively being used for future purchases of goods or services, provided no interest is paid on these funds
- bonds or other debt instruments that are standardised and issued *en masse* if a prospectus complying with the prospectus requirements set forth in article 1156 of the Swiss Code of Obligations (“CO”) exists

Furthermore, the following deposits are *not* considered to be deposits *from the public*:³⁸

- deposits from domestic and foreign banks or other companies under state oversight
- deposits from shareholders owning qualified shareholdings (more than 10% of the share capital or the votes) in the debtor and any parties affiliated or related with such shareholders
- deposits from institutional investors with professional treasury departments

Activities of FinTech companies may involve accepting deposits from the public (e.g. if a FinTech company accepts funds from investors and subsequently transfers funds to its clients). In order to reduce the risk to engage in regulated banking activities, the following may need to be considered:

- FinTech companies may decide to refrain from taking any funds in the first place.

- If deposits are involved the FinTech company may stay within the ambit of the “sandbox” exemption (see section 5.1.1.2) or it may avoid accepting more than 20 deposits from the public and refrain from recommending itself publicly for this purpose.³⁹
- FinTech companies may provide a clause in the relevant agreements obliging their clients to refrain from accepting more than 20 deposits from the public or recommending themselves publicly for this purpose.
- If deposits are involved the FinTech company may try to ensure that only exempt liabilities are in fact involved. This would, for example, be the case if credit balances on client accounts solely serve the purpose of the settlement of client transactions and if no interest is paid on these funds.⁴⁰
- FinTech companies may also decide to issue bonds or other debt instruments and to prepare a prospectus in compliance article 1156 CO in order to avoid deposit taking.
- Finally, since January 1, 2019, FinTech companies might also consider obtaining a FinTech license (see section 5.1.1.1) in order to be able to accept deposits from the public in the maximum amount of CHF 100 million.

5.1.3.2. Trading Facilities

Trading venues, i.e. stock exchanges and MTFs are regulated financial market infrastructures.⁴¹ They require a license from FINMA⁴² and are subject to a series of specific regulations.

A stock exchange is an institution for multilateral securities trading *where securities are listed* and whose purpose is the simultaneous exchange of bids between several participants and the conclusion of contracts based on non-discretionary rules.⁴³

An MTF is an institution for multilateral securities trading whose purpose is the simultaneous exchange of bids between several participants and the conclusion of contracts based on non-discretionary rules *without listing securities*.⁴⁴

³⁸ Article 5(2) BO.

³⁹ Whether for example the mere publication of credit requests via crowdlending platforms constitutes a public recommendation to accept deposits is still open. To our knowledge FINMA does not seem to be interpreting the law this way.

⁴⁰ Article 5(3)(c) BO. See also the FINMA factsheet “Crowdfunding”.

⁴¹ Article 2(a)(1) and 2(a)(2) FMIA.

⁴² Article 4(1) FMIA.

⁴³ Article 26(b) FMIA.

⁴⁴ Article 26(c) FMIA.

The main difference between the two types of trading venues is that at a stock exchange *listed* securities are being traded whereas at a multilateral trading facility *unlisted* securities are being traded.

Under Swiss law, “securities” (*Effekten*) are instruments, which are (i) standardised, (ii) suitable for mass trading, and (iii) either certificated securities (*Wertpapiere*), uncertificated securities (*Wertrechte*), derivatives⁴⁵ or intermediated securities (*Bucheffekten*).⁴⁶ Typical examples of securities include not only shares, bonds, notes, and other debt instruments, but may for example also include fractions of a loan if such fractions are standardised and suitable for mass trading. An instrument is deemed to be standardised and suitable for mass trading if it is (a) either publicly offered and has the same structure (interest, maturity) and denomination (amount) or (b) if it is placed with more than 20 investors and has not been specifically created for a particular counterparty/investor.⁴⁷ It is important to note that unlisted instruments may qualify as securities as well.

Even if no securities are traded, an institution or trading platform can still qualify as a so-called organised trading facility (“OTF”). According to the statutory definition, OTFs⁴⁸ are establishments for

- multilateral trading in securities or other financial instruments whose purpose is the exchange of bids and the conclusion of contracts based on discretionary rules;
- multilateral trading in financial instruments other than securities whose purpose is the exchange of bids and the conclusion of contracts based on non-discretionary rules;⁴⁹ and
- bilateral trading in securities or other financial instruments whose purpose is the exchange of bids.

FinTech companies operating platforms that allow for trading of shares, standardised debt instruments or other financial instruments, including securities issued in the form of asset tokens, might qualify as regulated trading venues. Should a particular business model include such activities the main questions for FinTech companies will likely be whether they qualify as an MTF (if securities are involved) or as an OTF, and hence require a license as a bank, securities dealer or trading venue.⁵⁰

5.1.3.3. Payment Systems

Payment systems are regulated financial market infrastructures.⁵¹ A payment system is “an entity that clears and settles payment obligations based on uniform rules and procedures”⁵² Specific duties of payment systems (e.g. regarding settlement and liquidity) have been set out in the implementing ordinance of the FMIA.⁵³

A payment system requires a license from FINMA only⁵⁴

- (i) if this is necessary for the proper functioning of the financial market or the protection of financial market participants; and
- (ii) if the payment system is not operated by a bank.

Operating a payment system may involve deposit taking. However, there is a “safe harbour rule”⁵⁵ which might be relevant for FinTech companies in this context. Funds that to a small extent are fed into a payment instrument or a payment system and that are exclusively being used for future purchases of goods or services may not qualify as deposits, provided no interest is paid. The following requirements must be met:⁵⁶

⁴⁵ Derivatives are “financial contracts whose value depends on one or several underlying assets and which are not cash transactions”. See article 2(c) FMIA and article 2(2) to 2(4) of the Financial Market Infrastructure Ordinance (“FMIO”).

⁴⁶ Article 2(b) FMIA.

⁴⁷ See article (2)1 FMIA.

⁴⁸ Article 42 FMIA.

⁴⁹ The term “non-discretionary rules” means that the operator of the trading facility has no discretion as to how interests may interact. Hence, the operator of the trading facility does not have discretion over how a transaction is to be executed.

⁵⁰ Article 43(1) FMIA et seq.

⁵¹ Article 2(a)(6) FMIA.

⁵² Article 81 FMIA.

⁵³ Article 82 FMIA i.c.w. article 66 et seq. FMIO.

⁵⁴ Article 4(2) FMIA.

⁵⁵ Article 5(3)(e) BO.

⁵⁶ FINMA-circular 2008/3, para. 18.1.

- (i) the funds may only be used for future purchases of goods or services;
- (ii) the maximum account balance per customer may not exceed CHF 3,000 at any time; and
- (iii) no interest may be paid.

If these requirements are met the liabilities involved are not deemed to be deposits and hence no banking license is required.

5.1.3.4. Securities Dealers

Securities dealers require a license from FINMA⁵⁷ and are subject to supervision as well as a series of specific regulations. The law provides for five categories of securities dealers: own-account dealers, issuing houses, derivatives firms, market makers, and client dealers.⁵⁸ Depending on the relevant business model and activities, FinTech companies might, in particular, qualify as own-account dealers or issuing houses. With the introduction of FinIA the current categories of securities dealers will be referred to as securities firms.⁵⁹ As such they will still require to be licensed by FINMA.⁶⁰

Especially FinTech companies engaging in trading activities relating to asset tokens qualifying as securities should make sure that they obtain a securities dealer license prior to engaging in any regulated securities dealing or a trading venue license prior to operating regulated trading facilities (see section 5.1.3.2).

5.1.3.5. Asset Management

Under the current regulatory framework activities relating to asset management and investment advice do not generally trigger prudential supervision. However, if the assets managed qualify as collective investment schemes or belong to a pension fund, specific supervision and licensing requirements exist. Also, asset managers as well as investment advisors will become subject to supervision and a stricter set of regulations once the FinSA and the FinIA enter into force (see section 5.1.2).

5.1.3.6. Anti-Money Laundering

Ensuring compliance with anti-money laundering regulation is often⁶¹ one of the key regulatory challenges for FinTech companies, both organisationally and financially. Swiss anti-money laundering regulation is based on three key elements:

- supervision of financial intermediaries either (i) directly by FINMA (note: as of January 1, 2020 financial intermediaries may not be directly supervised by FINMA anymore) or (ii) by self-regulating organisations, which are FINMA-supervised
- due diligence, reporting, identification, and record-keeping requirements applying to all financial intermediaries and
- sanctions in case of non-compliance

Article 305^{bis} of the Swiss Criminal Code (“SCC”) contains the criminal provision that prohibits all forms of money laundering. It states that “[a]ny person who carries out an act that is suitable to frustrate the identification of the origin, the tracing or the forfeiture of assets which he knows or must assume originate from a felony or an aggravated tax misdemeanour is liable to a custodial sentence not exceeding three years or to a monetary penalty”.

Financial intermediaries may be divided into two groups:

- Financial intermediaries belong to the “banking sector” if they are subject to comprehensive, prudential regulation under special legislation covering the whole range of their activities. Under these special laws, a financial intermediary is supervised in its activities by the appropriate regulatory authority designated in each of these laws. Such financial intermediaries are for example banks, holders of a FinTech license, securities dealers, insurance companies or central counterparties.⁶²
- Financial intermediaries belong to the “non-banking sector” if they “on a professional basis accept or

⁵⁷ Article 10 SESTA.

⁵⁸ Article 3 SESTO.

⁵⁹ Article 41 FinIA.

⁶⁰ Article 5(1) FinIA.

⁶¹ The Swiss government concluded, however, that anti-money laundering requirements are not “fintech-specific barriers to market entry”. See the “Background Documentation” of the Swiss Federal Department of Finance dated November 2, 2016, p. 2.

⁶² Article 2(2) AMLA.

hold on deposit assets belonging to third parties or assist in the investment or transfer of such assets".⁶³ According to a non-exclusive list this definition covers in particular persons who: (i) carry out credit transactions, (ii) provide services related to payment transactions, (iii) trade for their own account or for the account of third parties in bank notes or cash, money market instruments, currency, precious metals, commodities, and securities as well as their derivatives, (iv) manage assets, (v) make investments as investment advisers or (vi) hold securities on deposit or manage securities.⁶⁴ Before engaging in business activities, such financial intermediaries must join a self-regulatory organisation recognised by FINMA.⁶⁵

Many activities typically conducted by FinTech companies, as for example business models involving holding or depositing assets on behalf of clients are subject to anti-money laundering regulation. Basically there are three approaches for FinTech companies to handle anti-money laundering regulation:

- (i) they may refrain from financial intermediation activities
- (ii) they may cooperate with a regulated financial intermediary, such as a bank, as far as financial intermediation activities are required
- (iii) they may join a self-regulatory organisation complying with anti-money laundering regulation themselves

Apart from a few exceptions⁶⁶ all *professional* financial intermediaries are subject to the AMLA. A financial intermediary is generally deemed to engage in financial intermediation on a professional basis:⁶⁷

- if its activity generates a gross revenue of more than CHF 50,000 per calendar year
- if it enters into business relationships with more than 20 contracting parties per calendar year that are not limited to a one-time activity or if it main-

tains at least 20 such relationships per calendar year

- if it has unlimited power to dispose over assets belonging to others exceeding CHF 5 million at any point in time; or
- if it executes transactions of a total volume exceeding CHF 2 million per calendar year

The financial intermediaries' duties are set out in AMLA⁶⁸ and implementing ordinances and regulations.⁶⁹ Key duties are:

- duty to personally identify the client, i.e. the contracting party
- duty to identify the beneficial owner/economic beneficiary of the assets
- duty to re-identify the beneficial owner/economic beneficiary of the assets in certain circumstances
- specific clarification/verification duties amongst others with regard to transactions or business relationships with heightened risks
- duties relating to documentation of transactions and verifications as well as relating to record keeping
- duty to implement organisational measures, e.g. regarding training of employees and controls
- duty to report cases of suspicions of money laundering to the Money Laundering Report Office

Under certain circumstances and provided that specific requirements are met reduced duties may apply.

5.1.3.7. Consumer Credits

The CCA applies to consumer credits, i.e. loans granted to individuals on a professional basis for purposes other than business or commercial activities. As per April 1, 2019, also loans granted on a non-professional basis may be subject to the CCA, provided they are granted in cooperation with a crowdlending broker (*Schwarmkredit-Vermittler*), e.g. an operator of a crowdlending platform.⁷⁰

⁶³ Article 2(3) AMLA.

⁶⁴ The Anti-Money Laundering Ordinance ("AMLO") and FINMA-Circular 2011/1 set out further details as to when the professional practice of financial intermediation is subject to supervision.

⁶⁵ Article 14(1) AMLA.

⁶⁶ Article 2(4) AMLA.

⁶⁷ Article 7(1) AMLO.

⁶⁸ See article 3 et seq. AMLA.

⁶⁹ The agreement relating to the Swiss banks' code of conduct with regard to the exercise of due diligence (VSB 16) is of particular importance. It contains a detailed set of rules in connection with the identification of clients and beneficial owners.

⁷⁰ Article 2(b) CCA.

Therefore, FinTech companies may need to take into account the special regulations relating to consumer credits. The following duties/rights under the CCA may be of particular importance:

- duty to obtain a license in order to be allowed to grant or broker loans to consumers on a professional basis⁷¹
- restrictions relating to the advertisement for consumer credits⁷²
- requirements regarding the form and content of consumer credit agreements⁷³
- duty to not exceed the maximum effective annual interest rate set by the Swiss Federal Council⁷⁴
- duty to check the consumer's creditworthiness⁷⁵ as well as the right to access the information made available by the Credit Information Office (*Informationsstelle für Konsumkredit*)⁷⁶

5.1.3.8. Collective Investment Schemes

Collective investment schemes are “funds raised from investors for the purpose of collective investment, and which are managed for the account of such investors”.⁷⁷ Anyone who manages or acts as a custodian for collective investment schemes or distributes schemes of this kind to non-qualified investors or who distributes foreign collective investment schemes to qualified investors needs FINMA authorisation.⁷⁸ Generally, collective investment schemes regulation must be considered whenever a particular business model entails the pooling of funds or risks in connection with an investment.

An entity or a financial product qualifies as a collective investment scheme if the following criteria are met: (1) funds (2) that are raised from (more than one) investors (3) for the purpose of being collectively managed (4) for the account of such investors, (5) whereby the investors' investment needs are met on an equal basis.

The marketing of units in collective investment schemes is subject to a series of regulations including approval and licensing requirements. Marketing of units in collective investment schemes is defined very broadly. It includes all activities that directly or indi-

rectly aim at offering or selling shares or other units in a particular collective investment scheme or particular investment schemes to investors. This includes the use of any kind of advertising material, such as print and electronic media, information sheets, emails, cold calling, road shows, investors meetings or websites.

5.2. Economic Environment

*By Prof. Dr. Thomas Ankenbrand & Denis Bieri,
Institute of Financial Services Zug IFZ*

A favourable and supportive economic environment is crucial for any business to operate successfully. This section covers an evaluation of the Swiss customer base for FinTech solutions, the venture capital and ICO investment environment, and supporting programs relevant to the Swiss FinTech sector.

5.2.1. Customer Base

The existence of a pool of potential customers is crucial in order to be able to scale a business. In this regard, the conditions differ considerably for Swiss-oriented FinTech companies in the Business-to-Business (B2B) and Business-to-Customer (B2C) segment. For FinTech companies targeting businesses, Switzerland as one of the globally leading and most competitive financial sectors (Swiss Bankers Association, 2018a) offers a sizable pool of potential customers. By the end of 2017, there were 253 banks in Switzerland, a number that decreased continuously in the past ten years, as shown in Figure 5.1. This consolidation can be attributed to the challenging environment with factors such as rising regulatory requirements, the decline in margins, and the effects of digitalisation.

Besides this decreasing number of banks, Figure 5.1 shows that the share of the gross added value of the Swiss financial sector, i.e. banks and insurance companies, has decreased over the past years. However, with roughly CHF 60 billion added value reported in 2017, the Swiss financial sector still accounts for more than nine percent of Switzerland's total economic output.

⁷¹ Article 39 CCA.

⁷² Article 36 CCA et seq.

⁷³ Article 9 CCA et seq.

⁷⁴ Article 14 CCA.

⁷⁵ Article 22 CCA, article 28 CCA et seq.

⁷⁶ Article 23 CCA et seq.

⁷⁷ Article 7 CISA.

⁷⁸ Article 13(1) CISA.

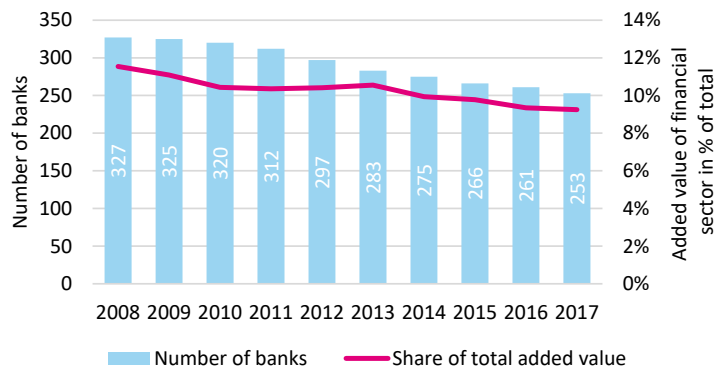


Figure 5.1: The Swiss financial industry (Sources: Swiss National Bank, 2018a; Federal Statistical Office, 2018a)

The international relevance is underlined by the fact that nearly half of the total of CHF 7,291.8 billion assets under management at Swiss banks comes from abroad and that over a quarter of the global cross-border assets are managed in Switzerland (Swiss Bankers Association, 2018a).

FinTech solutions as stated in a report by Ernst & Young (2017). Overall, the B2C market in Switzerland is too small for many of the FinTech business models. As a result, the share of Swiss-based FinTech companies with an international orientation has continuously increased in the past years (Ankenbrand et. al, 2018).

From a B2C perspective, Switzerland is a relatively small country with roughly 8.5 million residents as of the end of 2017 (Federal Statistical Office, 2018b). The demographic development in Switzerland is characterised by an aging population. Only 14 percent of the permanent resident population in Switzerland is aged between 25 and 34 years (Federal Statistical Office, 2018b), the age group that reveals the highest adoption rate for

5.2.2. Venture Capital and ICOs in FinTech

The year 2018 has been a record year in terms of venture capital investment volumes into the Swiss FinTech sector. Over the course of the year, a total of 68 publicly available funding rounds were conducted raising a total amount of CHF 324 million, as shown in Figure 5.2. Whereas the number of funding rounds remained stable in a year-to-year comparison, the total

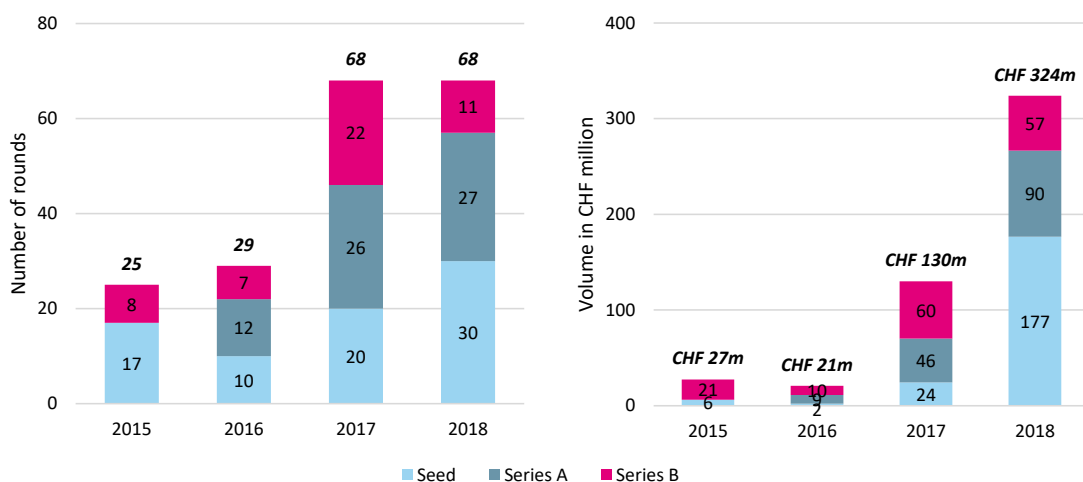


Figure 5.2: Venture capital invested in Swiss FinTech companies⁷⁹

⁷⁹ In this analysis, all later stage funding rounds, e.g. Series B or Series C, are summarised as Series B funding.

investment amount more than doubled (+149%). Especially Seed capital, i.e. the initial money required to start a new business, surged in 2018 with a total of CHF 177 million raised in 30 rounds. The largest share in Seed capital is accounted for by *SEBA Crypto AG*, which raised a total of CHF 100 million as announced on September 27, 2018. With CHF 90 million the volume of Series A capital rounds, typically used by a company to further develop its products and service and to undertake early stage business operations, roughly doubled in 2018. The volume of Series B funding, on the other hand, is within a similar range as in the previous year, amounting to a total of CHF 57 million. This kind of capital is typically raised in a later stage of a company's business life cycle and is often used to hire further talent and expand market reach.

Comparing 2018's venture capital investments into the Swiss FinTech sector with the amount invested into Swiss start-ups of all sectors, shows that FinTech accounts for 30 percent of the total number of venture capital rounds and slightly more than a quarter of the corresponding volume.⁸⁰

Other significant developments in 2018 include the creation of various venture capital funds targeting FinTech companies, among others. Examples include the establishment of *Avaloq Ventures*, the *Swisscanto Invest* growth fund, the *Swisscom Digital Transforma-*

tion Fund, and the foundation of the venture capital firm *Blockchain Valley Ventures*. Also in 2018, *SIX FinTech Ventures*, the corporate venture capital fund of *SIX* commenced operations.

Besides venture capital investment rounds, there were multiple initial coin offerings in the Swiss FinTech sector in 2018. Figure 5.3 reveals the total number and the total investment volumes raised by ICOs conducted by Swiss FinTech companies that were included in this year's study.⁸¹ In 2018, a total of USD 386 million were raised in 15 ICOs, representing a decrease in both the number of ICOs and the total volume raised by this alternative form of financing compared to the year 2017. The largest ICO in 2018 was conducted by *Envion* which raised roughly USD 100 million, followed by *Nexo* and *SwissBorg* with USD 52.5 and USD 50 million, respectively. With USD 386 million, the Swiss FinTech sector accounted for 7.2 percent of the global ICO volume raised in the fields of finance, payments, and trading & investing which amounted to a total of USD 5.4 billion in 2018 (CoinSchedule, online). With regard to mergers and acquisitions (M&A), however, there are generally fewer activities in Switzerland than worldwide, which limits the dynamics of the start-up sector (Kyora et al., 2018).

5.2.3. Incubators, Accelerators, Challenges & Awards

Switzerland hosts a broad range of incubator and accelerator programs for both Swiss-based and international FinTech companies. One of the initiatives with the longest track record is the *Fusion* accelerator located in Carouge, Geneva. The FinTech vertical of the program has been active since 2015 and has hosted over 40 start-ups since then. In 2018, the Swiss-based companies *Apiax*, *EZYcount*, *FinQuartz*, and *TRUSTLESS.AI* were added to *Fusion's* FinTech program, along with five companies from abroad (Fusion, online).

The *F10* accelerator sponsored by *SIX* is another prominent supporting program in the Swiss start-up ecosystem, offering the three programs "Idea to Prototype", "Prototype to Product", and "Product to Market" for companies at different stages along the start-up development cycle. In 2018, the *F10* accepted

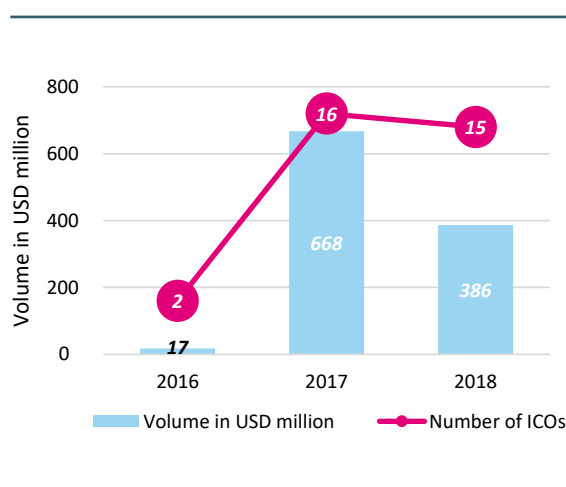


Figure 5.3: ICOs in the Swiss FinTech sector

⁸⁰ The total amount of venture capital investments into Swiss start-ups equals CHF 1,236 million raised in 230 rounds according to the *Swiss Venture Capital Report 2019* by *startupticker.ch* (2019).

⁸¹ This study only includes ICOs which are closed. Active ICOs or FinTech companies that have only concluded a pre-sale, but not yet a public sale, are not included.

the Swiss-based start-ups *advAIsoor.io*, *ambrpay*, *BlockState*, *Daego*, *ex indiciis*, *IBEx Insured*, *Jacob*, *Reportix*, and *VeriICO* to join the “Prototype to Product” program, and *WealthArc*, *TaxLevel*, *Brixel* to join the “Product to Market” program (F10, online; Netzwoche, online).

The *Kickstart Accelerator* is an initiative of *Impact Hub Zürich* and targets companies in the four verticals EdTech, FinTech & Crypto, Food & Retail Tech, and Smart Cities & Infrastructure. In 2018, the Swiss-based start-ups *Altoo* and *vlot* were admitted to the program along with seven start-ups from abroad (*Kickstart Accelerator*, online).

The year 2018 witnessed the launch of some new incubator and accelerator initiatives relevant to the Swiss FinTech sector. Examples hereof are the *CV Labs* blockchain incubator (CV VC, online) and the *Salesforce Accelerate* program for the EMEA region by *Salesforce*. The latter has already announced the admission of 14 Fin- and InsurTech companies including Geneva-based *InvestGlass* (*Salesforce*, online). Another newly launched initiative is the *Innovation garage* by *Generali Switzerland*, hosting the Swiss FinTech companies *Billte*, *Enterprise Bot*, *IMburse*, *Riskifier*, and *SHIFT Cryptosecurity* by the end of 2018 (*Generali*, online).

Besides incubator and accelerator programs, there have been other initiatives to support the Swiss FinTech sector in 2018. One of which is the *Venture Leaders FinTech roadshow* organised by *Venturelab*. The initiative included a one-week trip to New York for ten selected Swiss FinTech companies in order to connect to global investors. The companies invited to the roadshow, the so called *Swiss National FinTech Team 2018*, consisted of *3rd-eyes*, *AAAccell*, *Apiax*, *ARCATrust*, *Enterprise Bot*, *IMburse*, *Investment Navigator*, *SHIFT Cryptosecurity*, *Switzerland*, and *Tradeplus24* (*Venturelab*, online).

Organised challenges constitute a further attempt to strengthen the Swiss FinTech sector and can appear in different forms. One type of challenge that appeared in the past years in the Swiss FinTech field are hackathons. Examples of hackathons from 2018 are the *SIX-Hackathon* by *SIX* won by *sustAid* and the *Reinvent*

Finance hackathon by *Melonport* and the *Lucerne University of Applied Sciences and Arts* won by *Chrono-Logic*. Other challenges hosted in Switzerland in 2018 with winners from the Swiss FinTech sector include the *CV Competition* initiated by *inacta* and *CV VC* and won by *ambrpay*, the *ICO Race* by *Eidoo* and *Finlantern* won by *Pigzbe*, the *IMD Startup Competition 2018/2019* won by *Veezoo* alongside other Swiss-based non-FinTech start-ups, the *Swisscom Startup Challenge* with the three Swiss FinTech companies *AAAccell*, *Exeon Analytics* and *Sentifi* among the total of five winners, and the *Temenos Innovation Jam* won by *Sonect*.

In addition to challenges, there have been multiple award ceremonies in the Swiss FinTech ecosystem in the last year. Swiss FinTech companies that were among the award winners are *Creditgate24*, winning the first *BBVA Open Talent Awards*, *Alethena*, winning the first *Crypto Valley Association Blockchain Awards* together with Russia-based *Forseti*, *Tradeplus24*, winning the *Swiss WCM Awards* by *Swiss Post*, *Melonport*, winning the *Technology Pioneer Award* by the *World Economic Forum*, *Crealogix*, winning the *Best of Show Award* at the *Finovate Europe*, and *Proxeus* and *Loanboox*, winning the *Early Stage Startup of the Year* and *Growth Stage Startup of the Year* awards at the *Swiss Fintech Awards 2018*, respectively.

Swiss FinTech companies have also been considered by international supporting programs. *IMburse* and *Sonect*, for example, have been admitted to the *Plug and Play* accelerator in Munich and the *VC FinTech Accelerator* in the United States, respectively, *Private Alpha* won the Austria-based *FinTech Award Alpbach 2018*, and *Unity Investment* was awarded the best ICO project at the *Crypto Currency World Expo* in Poland.

Another development in the Swiss FinTech ecosystem was the creation of new co-working spaces. Examples hereof are *CV Labs* located in Zug and *Trust Square* located in Zurich, both providing co-working space not only for start-ups but also established companies in the field of Distributed Ledger Technology. Other co-working spaces that are open for FinTech companies include various *Technoparks* and *Impact Hubs* across Switzerland.

5.3. Social Environment

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In this section, an evaluation of selected relevant social factors for the Swiss FinTech industry is given. It covers a description of the Swiss talent environment, the media coverage of FinTech, and associations relevant to the respective sector.

5.3.1. Talent & Skills

As outlined in section 3.3, Switzerland is in an excellent position regarding its talent base and innovative power. This is underlined by the *IMD World Talent Ranking 2018* and the *Global Innovation Index 2018* reports that both rank Switzerland in the first position, which again is one of the reasons for Geneva and Zurich's top position in the FinTech hub ranking in section 3.5. However, the increasing demand for skilled staff and talent in the field of information and communication technologies, which is also highly relevant for the FinTech sector, poses a threat for further economic growth. This is one of the conclusions drawn in a report by the *Institute for Economic Studies Basel (IWSB)* that predicts a shortfall of 40,000 ICT-professionals for the Swiss economy for the year 2026 (IWSB, 2018). The *World Economic Forum* published another report in 2018, predicting major disruptions to labour markets triggered by the Fourth Industrial Revolution (World Economic Forum, 2018). On the one hand, the report estimates that there could be a shift in the division of labour between humans and ma-

chines that results in a displacement of up to 75 million jobs globally. On the other hand, 133 million new roles that are better adapted to the new division of labour could emerge. However, the disruptions to labour markets result in changes in the skill sets required in both old and new occupations. According to the report, Switzerland reveals the lowest average reskilling needs among all countries included, with an expected average timeframe required to retrain or upskill affected workers of 83 days. Figure 5.4 shows the predicted reskilling needs for the Swiss and the total global workforce over the 2018 to 2022 period. It reveals that a little more than half of the Swiss labour force does not need any reskilling in order to be prepared for future developments in the labour market. Roughly a quarter needs a reskilling timeframe of less than three months, 18 percent a period between three to twelve months, and seven percent will need over one year. At 46 percent, the share of the workforce that does not need any reskilling is lower on a global average, whereas the share that needs significant reskilling of over one year is three percent higher. In order to prepare the Swiss workforce and the society for the digital future, the Swiss Federal Council has adopted the strategy "Digital Switzerland" which includes a range of measures to be taken. The first of the nine fields of action include the promotion of education, research, and innovation and respective knowledge transfer in order to be able to exploit the opportunities of digitalisation. Other fields of action focus on improving the ICT-infrastructure, cyber security, resource efficiency, political participation, and e-government services (Federal Office of Communications

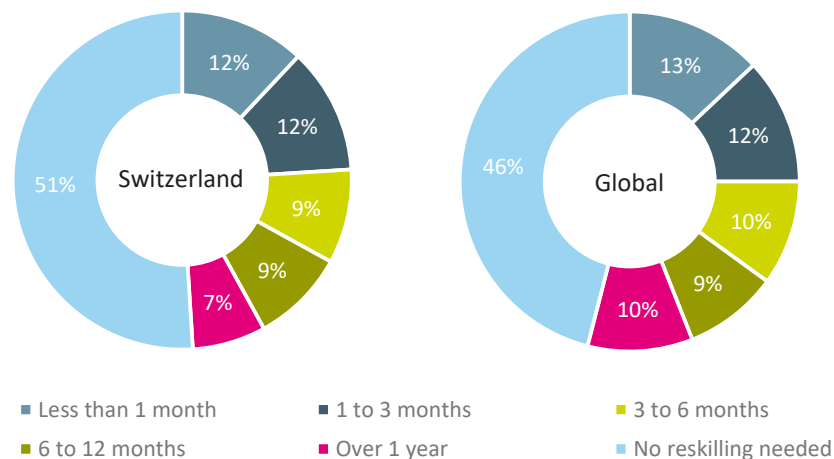


Figure 5.4: Reskilling needs (Source: World Economic Forum, 2018)

OFCOM, 2018). The strategy also includes promoting new business models and a short time-to-market of innovative solutions from Swiss start-ups. It explicitly underlines the important role of the Swiss FinTech sector to secure the competitiveness of the Swiss finance industry. In particular, the report states that “internationally, Switzerland enjoys a reputation as a trustworthy, reliable banking and insurance location. Combined with technological expertise and innovative capability, along with a well-developed infrastructure, Switzerland can protect and expand its position thanks to favourable conditions for the fintech sector” (Federal Office of Communications OFCOM, 2018, p.28).

The Swiss-based technology and innovation parks, which are often partially funded by public funds constitute another important factor to promote innovation in Switzerland. The *Association of Swiss Technology Parks and Business Incubators* consisted of 45 members by the end of 2018, spread all across Switzerland, which actively supported more than 2,000 companies (Swissparks.ch, online). The Swiss technology and innovation parks often work in close collaboration with domestic academia which in itself drives innovation and entrepreneurship. *The State of European Tech Report 2018* by *Atomico* summarises that “for its size, Switzerland is the publication powerhouse of Europe, driven by the strength of its world-leading research institutions such as ETH Zurich and EPF Lausanne” (Atomico, 2018, p. 87).

Besides governmental initiatives, the private sector itself has performed various activities to raise the

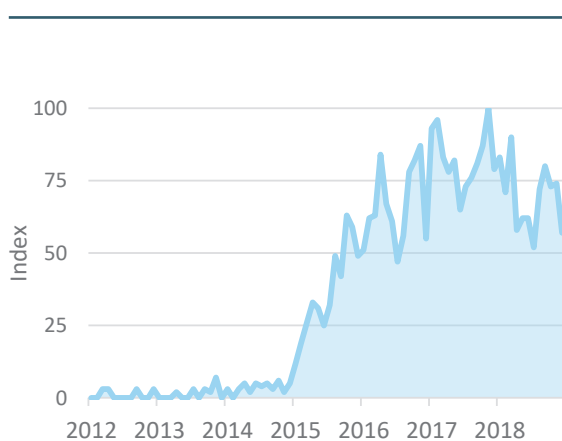


Figure 5.5: Google search queries for the term “FinTech” in Switzerland (Source: Google Trends, online)

public awareness on the consequences of digitisation. Two examples hereof are the *Swiss Digital Day* and the *Digital Festival 2018*. The *Swiss Digital Day* was organised by *digitalswitzerland* and supported by over 60 partners, mainly from the industry. The event took place on Thursday, October 25, 2018 at 14 different locations across Switzerland and Liechtenstein (Digitaltag.swiss, online). The *Digital Festival 2018* took place in Zurich, from September 13 to 16, 2018, and focussed on discussing the digital future in regard of its challenges and opportunities for the Swiss economy and society. The event, which also included a hackathon, was supported by a broad range of partners from the industry and the academia (Digital Festival, online).

Multiple FinTech-related events and initiatives to raise the public awareness in Switzerland were also held in 2018. *The Swiss FinTech Day 2018* on October 16, 2018, organised by the *Swiss Finance Startups* association, for example, included Switzerland’s first FinTech fair which boasted over 500 visitors (Swiss Finance Startups, online). Beside of these official events, an indication for the popularity of a subject are the number of meetups held on the particular topic. In 2018, Zug was the fastest growing tech hub in Europe, measured by the number of attendees to tech-related meetups (Atomico, 2018). This indicates that the Crypto Valley is more than just an ICO center.

5.3.2. Media

The media’s interest for FinTech stagnated in the past year. In 2018, the term “FinTech” was included in 1,996 articles in Swiss newspapers and magazines, representing a first-time year-to-year decrease from over 2,100 mentions in the year 2017. In the years 2015 and 2016, this number amounted to roughly 600 and 1,700 articles, respectively (Swissdox.ch, online). Besides the stagnation of the interest in FinTech from Swiss news outlets, the interest from the Swiss public has also decreased slightly over the past two years, as measured by the number of *Google* search queries for the term “FinTech” shown in Figure 5.5.

It reveals that the number of Swiss-based queries for “FinTech” over *Google* started to increase in January 2015 and reached the highest search volume, represented by an index value of 100, in November 2017. After that, the public interest seems to have declined. This development could have multiple reasons, like, for example, the continuous specialisation in the Fin-

| Year | Association | Description |
|------|--|---|
| 1912 |  swissbanking.org | <p>The <i>Swiss Bankers Association</i> was founded in 1912 in Basel and is the leading professional organisation of the Swiss financial centre. The association aims to maintain and promote the best possible framework conditions for the Swiss financial centre both at home and abroad. As it considers FinTech as one of the most disruptive factors for the business models of banks, it has intensively devoted itself to this topic for some time.</p> |
| 2013 |  bitcoinassociation.ch | <p>The <i>Bitcoin Association Switzerland</i>, located in Zurich, aims to promote digital currencies, especially <i>Bitcoin</i>, by organising regular events, resolving open legal questions, and educating the public on the matter. It is composed of an active community of supporters and corporate members. The association organises regular meetups in various locations in Switzerland.</p> |
| 2014 |  sictic.ch | <p>The <i>Swiss ICT Investor Club (SICTIC)</i> is a non-profit association aimed at connecting early stage tech start-ups, including those in the FinTech sector, with its network of business angels. The process of the deal, as well as the match-making is organised by <i>SICTIC</i>. The association, however, does not invest or hold equity in any of the pitching start-ups.</p> |
| 2014 |  swissfinancestartups.com | <p><i>Swiss Finance Startups</i> is a non-profit organisation run and organised by the ventures involved. The association wants to foster the common Swiss start-up spirit, support the exchange of ideas as well as industry know-how, and help to educate the outside, non-start-up world about the brilliant ventures. Start-ups, as well as supporters are admitted to the association.</p> |
| 2015 |  swissfinte.ch | <p>The <i>Swiss Finance + Technology Association (SFTA)</i> is a volunteer-led independent association, which aims to connect Swiss FinTech to leading global centres, offer meaningful information and content, advocate and mediate for a more supportive business, regulatory, and innovation environment, and strengthen Switzerland as a financial centre. The FinTech community <i>Swiss Financial Technology</i> is connected to the SFTA.</p> |
| 2015 |  digitalswitzerland.com | <p><i>digitalswitzerland</i> is a cross-industry association with the purpose of making Switzerland a leading hub for innovation and technology. The association focuses on multiple industries like FinTech, Life Science, Fashion, and MedTech. The following key areas are of particular importance: Attracting digital talent from abroad, supporting its members in mastering the digital transformation and improving the Swiss start-up ecosystem.</p> |
| 2015 |  swisscrowdfundingassociation.ch | <p>The <i>Swiss Crowdfunding Association</i> consists of more than 30 platforms of the type crowd-donation, crowdlending, crowdinvesting and real estate crowdfunding. It aims to promote crowdfunding in Switzerland, to disseminate best practices among the actors, to do research in this field and to spread information to media and politics.</p> |
| 2016 |  globalfintechassociation.io | <p>The <i>Global FinTech Association's</i> goal is to address and coordinate the FinTech industry's needs and challenges on a global scale. Its members can exchange ideas and challenges in the FinTech space, network with FinTech companies globally and jointly shape the FinTech industry's frameworks. The association has its registered office in Zurich.</p> |
| 2016 |  swissfintechinnovations.ch | <p><i>Swiss FinTech Innovations</i> is an association of financial institutions in Switzerland. Its goal is to make Switzerland a leading FinTech hub worldwide. The association focuses on partnerships and cooperation with various stakeholders from the FinTech industry. In addition, it aims to create new ideas and to work on the regulatory framework, as well as bring FinTech start-ups and established companies to work in collaboration.</p> |
| 2017 |  cryptovalley.swiss | <p>The <i>Crypto Valley Association</i> is an organisation destined to coordinate, accelerate, and scale the further development of the Crypto Valley into the world's best ecosystem for crypto technologies and businesses. <i>Bitcoin Suisse, Bussmann Advisory, iprotus, Lucerne University of Applied Sciences and Arts, Luxoft, Monetas, and Thomson Reuters</i> are the founding members of the association.</p> |
| 2017 |  mama.global | <p>The <i>Multichain Asset Managers Association (MAMA)</i> is a trade body initiated by <i>Melonport AG</i>, which represents asset management companies, investors, technology providers, service providers and ecosystem players interested in working towards a new vision for asset management using blockchain and other supporting decentralised technologies.</p> |






| Year | Association | Description |
|------|--|---|
| 2017 |  cryptopolis.city | The <i>CryptoPolis Association</i> is an independent, institutional-supported association established to take full advantage of Switzerland's strengths and the proximity to the metropolis of Milan to build the one of the leading blockchain, cryptographic technologies and FinTech ecosystem. |
| 2017 |  regtechassociation.org | The <i>International RegTech Association (IRTA)</i> is an international non-profit association for regulatory technology with a chapter in Switzerland founded in 2017. The IRTA is destined to ease and accelerate the evolution of the RegTech industry by bringing together people, tools and policies. In particular, the association aims to facilitate integration, collaboration and innovation of all stakeholders in the financial industry. |
| 2018 |  cmta.ch | The <i>Capital Markets and Technology Association (CMTA)</i> is a Geneva-based association established by <i>Lenz & Staehlin</i> , <i>Swissquote</i> , and <i>Temenos</i> for creating standards around facilitating the use of Distributed Ledger Technology in the field of capital markets. In particular, the association aims to create standards for issuing, distributing and trading tokenised securities. |
| 2018 |  swissblockchainassociation.ch | The Geneva-based <i>Swiss Blockchain Association</i> aims to further advance the general conditions for companies active in the field of Distributed Ledger Technology and to further raise the awareness and understanding of the implications of DLT to the general public. The association is supported by multiple companies from the Swiss financial industry. |
| 2018 |  lendingassociation.ch | The <i>Swiss Marketplace Lending Association (SMLA)</i> is an association based in Zug which brings together different stakeholders of the crowdfunding industry. Its goals are to increase the transparency and to raise awareness for the asset class of marketplace lending for professional and private investors, and to foster the cooperation within the sector. |

Table 5.1: Swiss-based associations related to FinTech

Tech area with the emergence of new verticals such as InsurTech, RegTech, and PropTech which gained traction over the past years. From a cantonal perspective, the number of search queries for “FinTech” in relation to the total amount of search queries was highest in Zug, which ranked 3rd in 2017, followed by Zurich (1st in 2017) and Geneva (2nd in 2017). The interest for FinTech thus seems to be highest in the cantons with the largest number of resident FinTech companies (see section 6.1). The large interest in FinTech in the canton of Zug is likely based on its role as a global hub for Distributed Ledger Technology.

5.3.3. Associations

Associations are an integral part of the FinTech ecosystem for clustering and representing common interests of the sector. In 2018, three associations related to FinTech were founded in Switzerland, two in the field of Distributed Ledger Technology, the *Capital Markets and Technology Association (CMTA)* and the *Swiss Blockchain Association*, as well as the *Swiss Marketplace Lending Association* in the field of crowdfunding. An overview of all the Swiss-based and FinTech-related associations is illustrated in Table 5.1.

5.4. Technological Environment

By Prof. Dr. Thomas Ankenbrand,
Institute of Financial Services Zug IFZ

As described in section 3.4, cloud computing, AI, and DLT are currently the most prominent technical drivers in the financial industry. In line with the headline of the *Swiss Startup Radar*, which considers Switzerland a “Deep Tech nation” (Kyora et al., 2018), the results of the FinTech hub ranking in section 3.5 paint a similar picture. Both Zurich and Geneva are in a very good position in regards to the research oriented indicators. *Google* and *IBM*, among others, have world leading AI and quantum computing research centres located in Switzerland, without well-known governmental research institutes.

However, the hub ranking also highlights some of the drawbacks Switzerland has in comparison to other leading FinTech hubs. The first one is that of the lack of e-governmental services. In an attempt to counteract this weakness, the Swiss government has developed a strategy called “Digital Switzerland”, which incorporates the concept of e-government services

(see section 5.3.1). This strategy is currently under revision and seeks to improve the way the population and businesses can efficiently and digitally deal with authorities (Federal Office of Communications OFCOM, 2018). Though the definition of a technological strategy is important, the proof of it essentially lies in its implementation and execution.

The second weakness identified by the hub ranking is the low online participation rate of the Swiss population. Generally, Swiss people are not inclined to reject the use of new technologies. This is supported, for instance, by the acceptance and even inclusion of chatbots in several use cases. 70 percent of Swiss residents could imagine using or already have experience with chatbot communication (Pidas, 2018). The main advantage is high availability and an immediate response, but the main potential disadvantage is the fact that the chatbot may not understand the question posed (Pidas, 2018).

The technological environment in the Swiss financial industry is characterised by a high level of outsourcing (see section 7.1). Most of the banks use standard software solutions from *Avaloq*, *Finnova*, *Finstar*, *Temenos*, and other providers, with more complex technological processes being outsourced. The banks generally use outsourcing services for the operation of the software from different providers like *Avaloq*, *Inventx* and *Swisscom*. Despite the advantages of cloud computing, which include the availability, scalability, and flexibility of cost structures, so far the majority of banks prefer traditional outsourcing models. The main concerns the banks have are related to data security and regulatory issues associated with the cloud computing technology.

There are three types of cloud solutions: public, private and hybrid clouds. The public cloud, on the one hand, is the typical cloud with global datacentres and which is accessible to everyone who has completed a simple registration process. The private cloud on the other hand, is not publicly available. The client structure and datacentre infrastructure is tailor-made to suit specific needs. The disadvantages of a private cloud are the lower scalability and higher costs. The hybrid cloud combines the advantages of the private and public cloud (Rhyner et al., 2018). The outsourcing providers offer hybrid cloud or Swiss banking cloud solutions. This means that the operation is undertaken in Switzerland and thus compliant with the Swiss legal and regulatory requirements. Most of the Swiss software and outsourcing providers are also active in the AI and DLT area.

Beside the development on the infrastructure side, there is also a need for an integration path for new FinTech solutions on the application or software level. The interface between the traditional core banking software and innovative solutions of third parties are known as Application Programming Interfaces (APIs). APIs constitute an important element in the process of integrating new technologies and solutions, and are therefore encouraged by different initiatives. The *Swiss Fintech Innovations Association* (SFTI) supports the establishment of APIs for Swiss financial institutions (SFTI, 2018). As a further example, the *Swiss Corporate API* is an initiative by Swiss banks to offer new payment and financial management solutions with secure interfaces. Such a central standard API platform offering a single point of entry creates an advantage for banks, as well as third party providers (SIX, 2018). Most of the standard software providers like *Avaloq*, *Finnova*, *Finstar*, and *Temenos* also offer their own APIs (*Avaloq*, online; *Finstar*, online; *Finnova*, online; *Temenos*, online).

6. Swiss FinTech Companies

In this chapter, the empirical analysis of the Swiss FinTech sector is given. The facts and figures presented in the first two sections are based on a survey among Swiss FinTech companies and on information that was publicly available. Sections 6.3 to 6.8 give an in-depth analysis of current developments in the six different main FinTech product areas, as defined in section 2.1.

6.1. Overview of Swiss FinTech Companies

By Prof. Dr. Thomas Ankenbrand & Denis Bieri,
Institute of Financial Services Zug IFZ

After two years of constant growth, the Swiss FinTech sector has grown significantly in the past year. By the end of 2018, there were a total of 356 Swiss FinTech companies, representing an increase of 62 percent from 220 companies one year earlier (see Figure 6.1). This significant growth was mainly driven by FinTech companies in the field of *Distributed Ledger Technology*, whose number more than tripled. The year-to-year growth rates of the other five product areas range between 17 percent (*Banking Infrastructure*) and 38 percent (*Payment*). From the total of 356 companies, 122 are active in the field of *Distributed Ledger Technology*, 66 in *Investment Management*,

56 in *Banking Infrastructure*, 42 in *Deposit & Lending*, 36 in *Payment*, and 34 in *Analytics*. In relative terms, the field of *Distributed Ledger Technology* accounts for over one third of all Swiss FinTech companies, followed by *Investment Management* with 19 percent. *Analytics* and *Payment*, the smallest product areas measured by the number of FinTech companies, achieve a share of ten percent each. Comparing the distribution of the Swiss to the global FinTech sector analysed in chapter 4 shows that Swiss FinTech companies are significantly more active in the field of *Distributed Ledger Technology*, but less in the area of *Banking Infrastructure*, in relative terms. This applies to the year 2017 as well as 2018, whereby the effect was accentuated last year by the strong growth in the number of Swiss FinTech companies in the DLT category.

In section 2.1 we introduced a secondary framework for classifying FinTech companies. The results of this two-dimensional framework, which distinguishes between the product area and the applied technology of a FinTech company, is given in Figure 6.2. From a product area perspective, of the total of 356 companies in the Swiss FinTech sector, 135 are active in the category *Investment Management* (38%), 105 in *Banking Infrastructure* (29%), 60 in *Payment* (17%), and 56 in *Deposit & Lending* (16%). The larger

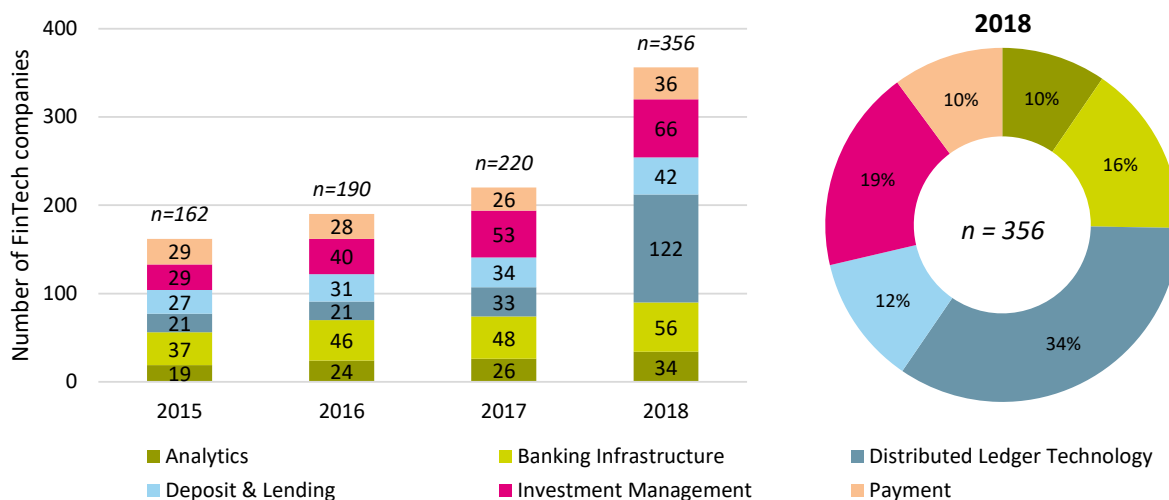


Figure 6.1: Number of FinTech companies in Switzerland (n=356)

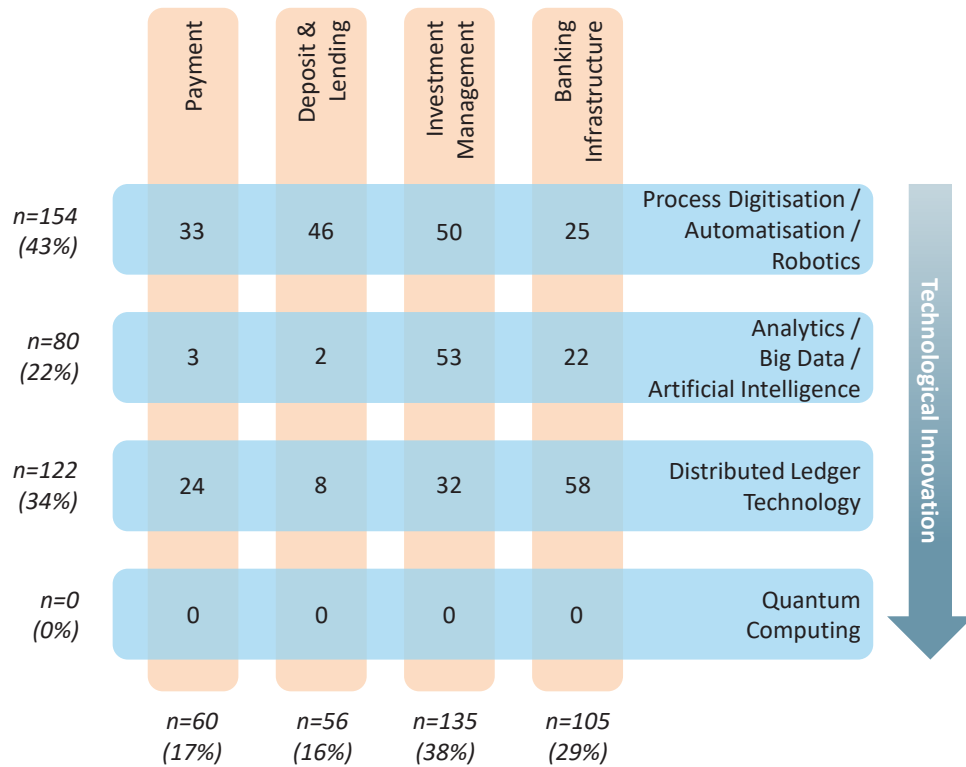


Figure 6.2: FinTech grid (n=356)

number of companies in these four product areas in comparison to the main classification stems from the methodology, as companies that were classified into the categories *Analytics* and *Distributed Ledger Technology* are now also assigned to a specific product area. From a technological point of view, Figure 6.2 reveals that out of the areas *Analytics* and *Distributed Ledger Technology*, only the former gains in the total number of companies assigned to it (+46 companies). The reason for this is that the DLT reference of a company is always regarded as the primary classification characteristic in our main classification framework, while the use of analytical tools is regarded as the secondary classification characteristic behind a clear reference to either *Banking Infrastructure*, *Deposit & Lending*, *Investment Management*, or *Payment*. In relative terms, *Process Digitisation/Automation/Robotics* serve as the technological backbone for 43 percent of the Swiss FinTech companies, followed by *Distributed Ledger Technology* (34%) and *Analytics/Big Data/Artificial Intelligence* (22%). *Quantum Computing*, which is

still in a very early stage, is not (yet) applied by any of the Swiss FinTech companies.

The increase in the total number of Swiss FinTech companies by 136 over the year 2018 results from three different factors, as illustrated in Figure 6.3. Firstly, there have been a total of 57 new incorporations of FinTech companies in Switzerland in the year 2018. Secondly, a total of 93 companies with an inception date prior to the year 2018 were newly included in our database. Reasons for these new inclusions include the switch of a company's business model to FinTech, formerly having had a non-FinTech focus, or the public appearance of a company that initially operated covertly. Thirdly, 14 companies founded prior to 2018 were excluded from our database because they have either shut down their business, merged, or changed their business models away from FinTech.

As shown in Figure 6.4, 39 of the total 57 incorporations of Swiss FinTech companies in the year 2018

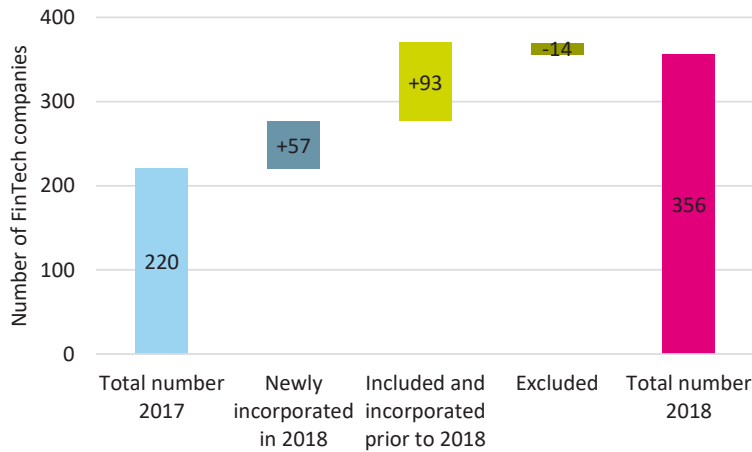


Figure 6.3: Year-to-year change in total number of FinTech companies

are accounted for in the field of *Distributed Ledger Technology*. The second largest number of incorporation is observed in the *Deposit & Lending* product area (6), followed by *Analytics* (4), *Payment* and *Investment Management* (3 each), and *Banking Infrastructure* (2). The figure also reveals that the FinTech sector has grown continuously since the year 2007, with the number of incorporations peaking in 2017.

The decline in the number of foundations in the year 2018 compared to the previous year needs to be interpreted with caution, since many newly founded companies are not publicly operative in their first months. As a consequence, we expect the number of incorporations in the year 2018 to increase in the coming months. Comparing the number of incorporations in the Swiss FinTech sector to those on a global

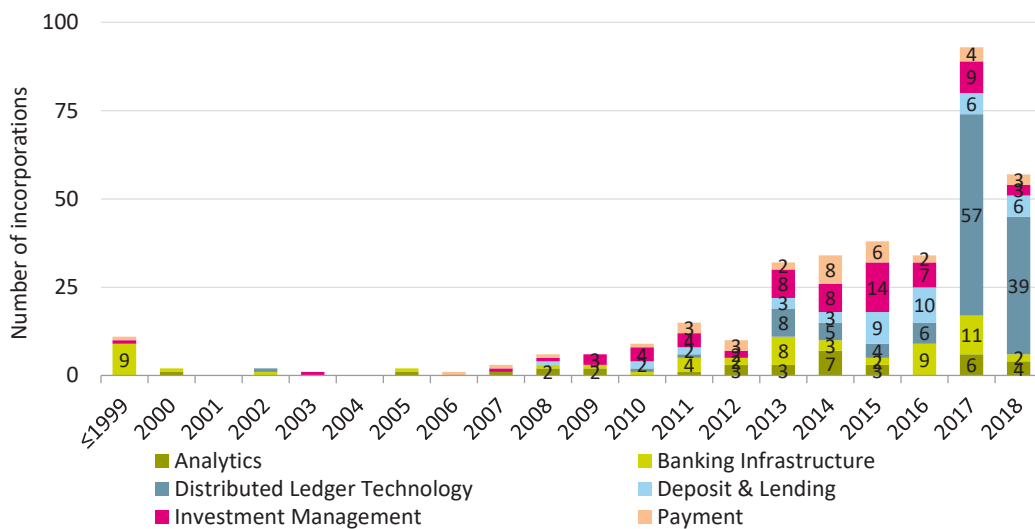


Figure 6.4: Number of FinTech company incorporations per year (n=356)

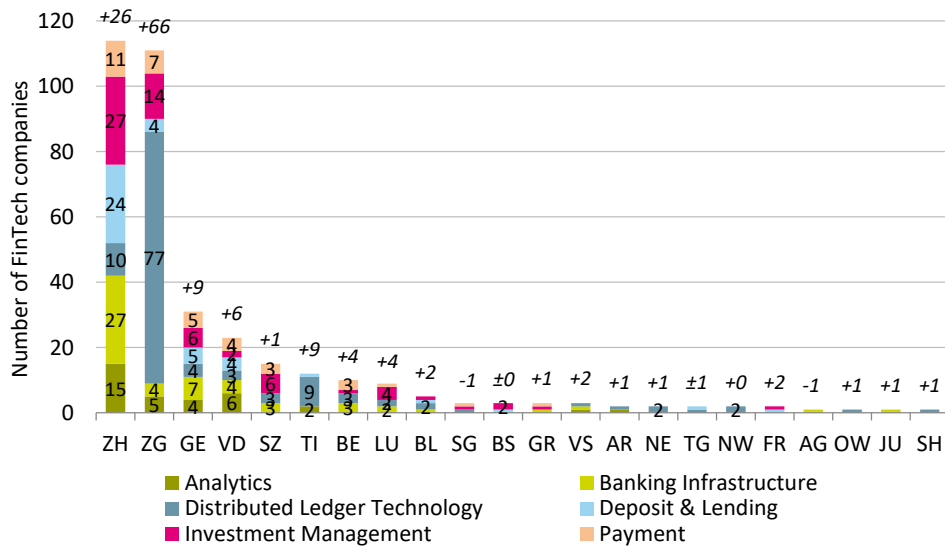


Figure 6.5: Number of FinTech companies by region (n=356)

scale (see Figure 4.2) shows that both sectors have undergone a similar development. Globally, the number of incorporations also started to increase in the year 2007 but already reached its highest level in the years 2012 to 2014. In the years 2016 and 2017, the number of foundations of FinTech companies dropped significantly. This does not come as a surprise, since chapter 4 only analyses the world's leading FinTech companies, which typically need to be operative for some time to achieve their leading status. The overall growth of the Swiss FinTech sector in the last two years has been largely driven by companies in the product area of *Distributed Ledger Technology*, accounting for a total of 96 incorporations and outpacing the remaining five FinTech product areas by far. This development coincides with the emergence of the so-called "Crypto Valley" in the canton of Zug which is also reflected by the large increase of the total number of Zug-based Swiss FinTech companies in Figure 6.5. With an increase of 66 new companies in the year 2018, Zug reveals the largest growth in resident FinTech companies, followed by Zurich with an increase of 26, and Geneva and Ticino with an increase of nine companies each. Looking at the can-

tonal distribution of the Swiss FinTech sector by the end of 2018, Zurich takes the leading position with a total of 114 companies. The leading position of Zurich is not surprising, given its position as one of the globally leading financial centres and consequently its large pool of potential customers for FinTech companies of all product areas. Despite the strong growth, Zug on the second position (111 companies) was not yet able to overtake Zurich.⁸² A comparison of the two leading cantons as measured by the number of resident FinTech companies reveals that Zurich exhibits a higher distribution of its companies over the six main FinTech companies, whereas Zug mainly hosts companies in the field of *Distributed Ledger Technology*. A similar concentration is also witnessed in the canton of Ticino which positions itself as "Cryptopolis", i.e. as a hub for Distributed Ledger Technology. Analogous to the findings in last year's study, the third largest amount of resident FinTech companies is hosted by Geneva (31 companies), which, however, lags considerably behind Zurich and Zug.

After having analysed the temporal development of the Swiss FinTech sector in terms of the total number

⁸² Note that we did not include Zug in our FinTech hub ranking due to a lack of consideration of the indicators on a city level. Moreover, the geographical proximity between Zug and Zurich suggests that the general factors between the two cities do not differ considerably.

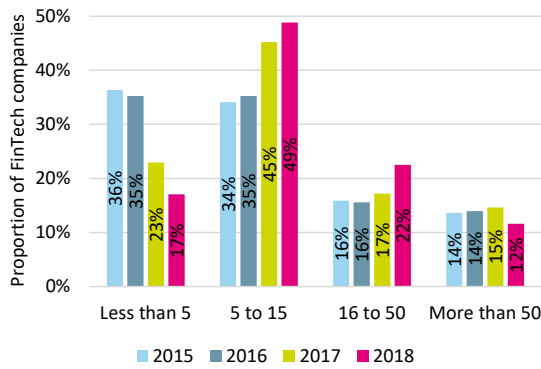


Figure 6.6: Proportion of FinTech companies by employees (n₂₀₁₈=258)

of companies, incorporations, and geographical distribution of Swiss-based companies that qualify under the definition in section 2.1, the following sections focus on shedding some light on their business models.

The production side of a company can be characterised by three different factors, i.e. the key resources, key activities, and key partners, as outlined by the Business Model Canvas of Osterwalder and Pigneur (see section 2.3). Figure 6.6 shows the findings concerning the first key resource, the number of employees in the FinTech sector measured in full-time equivalents (FTEs). It reveals that the trend towards larger companies in terms of the workforce continued in 2018. Whereas the share of companies employing less than five FTEs decreased from 23 to 17 percent, medium-sized companies with 5 to 15 and 16 to 50 FTEs have increased their shares from 45 to 49 per-

cent and 17 to 22 percent, respectively. This trend towards larger companies in terms of their workforce can partially be explained by the large growth of companies in the field of *Distributed Ledger Technology*. These companies are typically well funded, e.g. via initial coin offerings, which allows them to employ a respectable number of employees already at the beginning of their business life cycle. Thus, it does not come as a surprise that the shares of the two middle intervals in Figure 6.6 started increasing in 2017 and 2018, i.e. the two years that have seen the incorporation of 96 FinTech companies in the respective category. On the other hand, the proportion of FinTech companies that employ more than 50 FTEs declined in the year 2018, though not in absolute but in relative terms. Of the total workforce employed by Swiss FinTech companies, 67 percent is located in Switzerland. A breakdown of this share is given in Figure 6.7 (left-hand side), alongside the distribution of all employees over the six main FinTech product areas (right-hand side).

Deposit & Lending, Analytics, and Distributed Ledger Technology constitute the product areas with significant differences to the average. Whereas 89 percent of the workforce of companies in the former category are located in Switzerland, this share is significantly lower for companies in the two latter categories (57% and 58%, respectively). The right-hand illustration in Figure 6.7 reveals that FinTech companies in the field of *Banking Infrastructure* employ by far the most FTEs among the six main FinTech product areas. Of all companies that revealed information on their workforce, 74 percent of the FTEs can be assigned to the respective category. The share of the other prod-

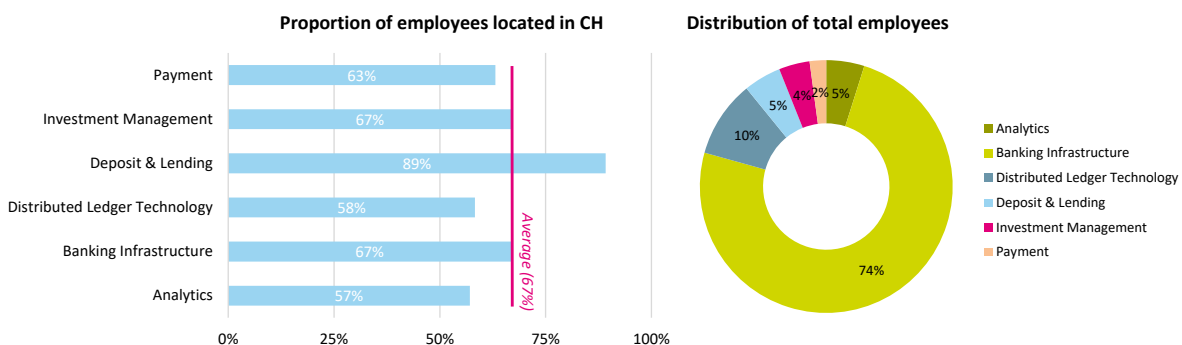


Figure 6.7: Proportion of employees located in CH and distribution of total employees (n=161)

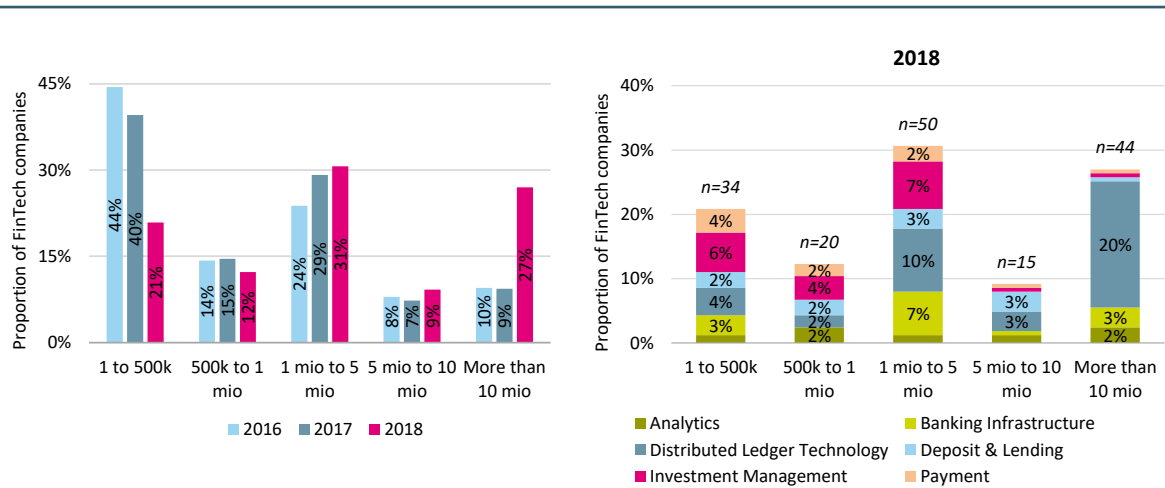


Figure 6.8: Proportion of FinTech companies by total funding (n₂₀₁₈=163)⁸³

uct areas range between ten percent (*Distributed Ledger Technology*) and two percent (*Payment*). The significant role of the *Banking Infrastructure* product area does not come as a surprise, given that it includes large providers for banking software such as *Avaloq* and *Finnova* that have been on the market for multiple years.

Besides the number of FTEs, the amount of funding constitutes the second key resource of a business. As already pointed out in section 5.2.2, the Swiss FinTech sector has raised a total of CHF 324 million through traditional venture capital rounds and CHF 386 million through initial coin offerings in 2018. Figure 6.8 reveals the temporal development of the proportion of FinTech companies by total funding (left-hand side) and a breakdown of the 2018 proportions into the six product areas (right-hand side). Analogous to the temporal development of the workforce employed by Swiss FinTech companies, the total funding shows tendencies towards larger capitalisations. On the one hand, the proportion of FinTech companies with funding between CHF 1 and 500,000 has decreased from 40 percent in the year 2017 to 21 percent in 2018. On the other hand, the proportion of companies with a capitalisation of more than CHF 10 million has increased from 9 percent to 27 percent. The large increase of the share of well-funded companies can again be attributed to the emergence of

well-funded companies in the field of *Distributed Ledger Technology*, e.g. by conducting an ICO with figures that are typically publicly available, to a significant extent, as shown in the right-hand figure of Figure 6.8. Of the total 44 companies in the largest funding interval, 32 are categorised into the *Distributed Ledger Technology* product area. Overall, these companies account for 20 percent of all companies that revealed information on their total funding. The positive development in the Swiss FinTech sector towards larger companies both in terms of FTEs employed, as well as capitalisation, points towards an increasing maturation of the sector.

Key activities present the second elementary factor on the production side of a business model. Unlike the key resources, the temporal development of the key activities does not point towards a maturation of the FinTech sector. The proportion of FinTech companies that are actively programming their solution, conduct marketing and customer acquisition activities, and/or running the operative business and serving clients has not changed significantly since the year 2016. However, a breakdown of these three key activities into the six main FinTech categories shows that especially FinTech companies in product areas with a higher degree of technological requirements such as *Analytics* and *Distributed Ledger Technology* tend to focus more strongly on programming their solutions

⁸³ The year 2015 is not included due to the lack of respective data.

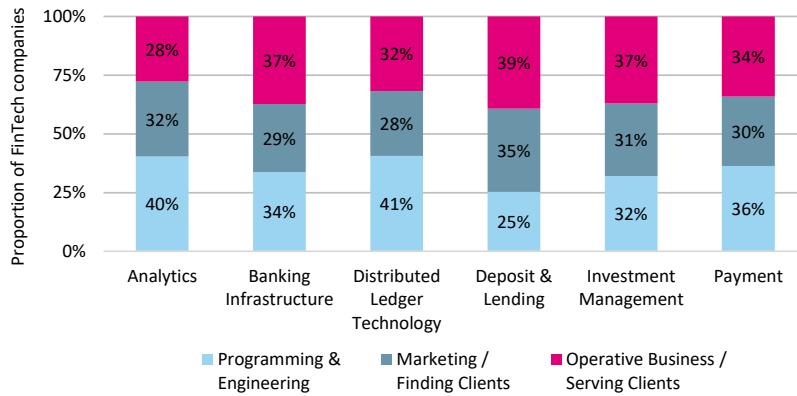


Figure 6.9: Proportion of FinTech companies by key activities (n=201)

(see Figure 6.9). Companies in the field of *Banking Infrastructure*, *Deposit & Lending*, and *Investment Management* tend to be in a later stage of the business life cycle and are more frequently in the phase of running their business. These product areas include solutions like personal finance management tools, crowd-funding platforms, and robo-advisors that have been on the market for a while now.

Key partners as the third elementary factor on the production side of a business model includes the most important relationships of a company in order to deliver its value proposition. With 13 mentions among all the FinTech companies that revealed information on the key partners, *Swisscom* takes the leading position. Positions two and three are occupied by *SIX* and *PwC* with ten and nine mentions, respectively.

According to the Business Model Canvas, the distribution side of a business model contains the following four factors: customer relationships, channels, customer segments, and revenue streams. When looking at the first two factors, i.e. the way a company communicates and interacts with its clients, the majority of Swiss FinTech companies (78.2%) pursue a hybrid digital and personal strategy, meaning that they provide both digital channels such as apps, but also personal channels such as phone or face-to-face interaction. 20.4 percent of Swiss FinTech companies follow a fully digital strategy. At 1.5 percent, fully personal interaction is negligible. Figure 6.10 shows that especially companies which target businesses as custom-

ers (Business-to-Business or B2B) or both businesses and private individuals (Business-to-Customer or B2C) pursue a hybrid communication and interaction strategy. Companies fully focused on private individuals exhibit a higher share of fully digital channels. The difference in the strategies pursued depending on the customer segments can be attributed to the higher need for customised solutions for business customers, who typically require some degree of personal interaction. Companies in the B2C segment, on the other hand, need to generate a critically sized customer base which requires scalable solutions. One way to achieve scalability is providing fully digital services without the need of personal interaction.

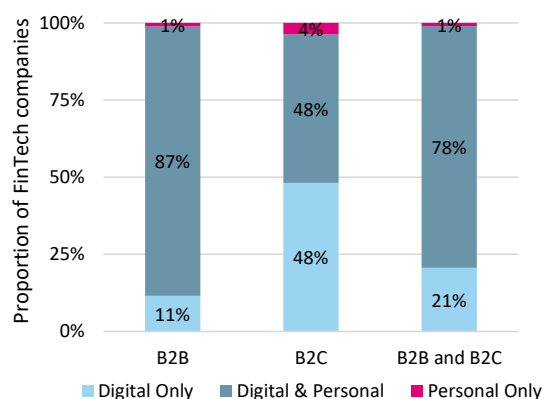


Figure 6.10: Channels by customer segment (n=206)

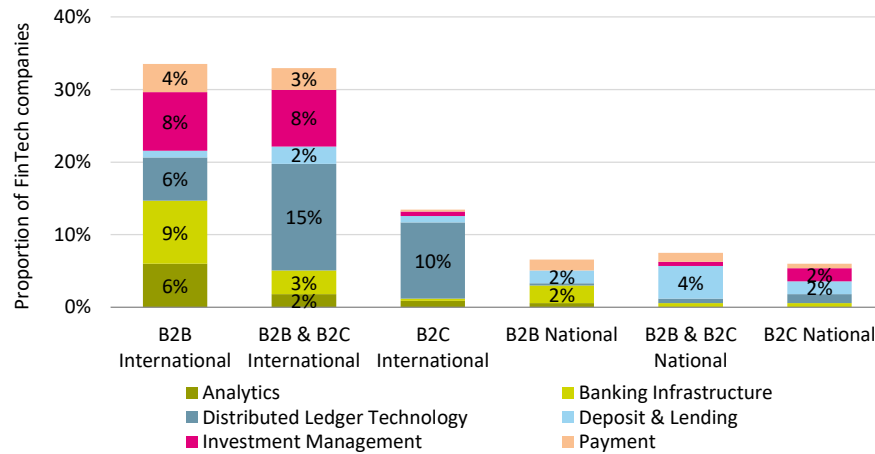


Figure 6.11: Proportion of FinTech companies by markets served (n=334)

The customer segments are not only defined by the type of a customer, i.e. a business or a private individual, but also by its geographical location. Figure 6.11 shows the proportion of Swiss FinTech companies by market served, distinguishing between these two perspectives. It reveals that the Swiss FinTech sector has a pronounced international orientation.⁸⁴ Summing up the respective proportions shows that 80 percent of the Swiss FinTech companies are active internationally. One year earlier, this share stood at 74 percent. As shown in Figure 4.4, the share of internationally oriented FinTech companies is lower on a global scale (62%). This difference is not surprising given the significantly larger domestic markets, especially in the B2C segment, of the top three countries as measured by the total number of leading FinTech companies, i.e. the United States, the United Kingdom, and China. In the Swiss FinTech sector, companies from five of the six main FinTech categories predominantly target international customers, with *Analytics* and *Distributed Ledger Technology* (both 94% of the companies) accounting for the highest proportions, followed by *Investment Management* (87%), *Banking Infrastructure* (78%), and *Payment* (69%). The only exception is *Deposit & Lending* with two thirds of its companies focusing on the Swiss market. Besides the predominantly international orientation, the majority of Swiss FinTech companies either solely target businesses as

customers (40%) or both businesses and private individuals (40%). Private individuals exclusively are only targeted by 20 percent of the companies. However, comparing these proportions to the year 2017 shows that there has been a small shift from pure B2B models to models which also target private individuals. This again can be explained, at least partially, by the increased share of companies in the field of *Distributed Ledger Technology* as a percentage of the total number of Swiss FinTech companies, since solutions in said field often do not distinguish between businesses and private individuals, but are open to everyone. Globally, the leading FinTech companies tend to be more specialised in terms of targeting a specific client segment, resulting in a lower share of companies with both a B2B and B2C orientation.

From 2015 to 2017 a clear shift from the commission revenue model traditionally sought by banks towards more technology-driven revenue models like license fees or Software-as-a-Service (SaaS) revenue was witnessed in the Swiss FinTech sector. In 2018, this trend weakened or even reversed, as shown in Figure 6.12. As in the previous three years, commissions (30%) were still the number one source of income for Swiss FinTech companies in 2018, followed by SaaS (27%) and license fees (23%). Whereas the proportion of FinTech companies with a commission revenue model

⁸⁴ In this analysis, an international orientation also includes Switzerland.

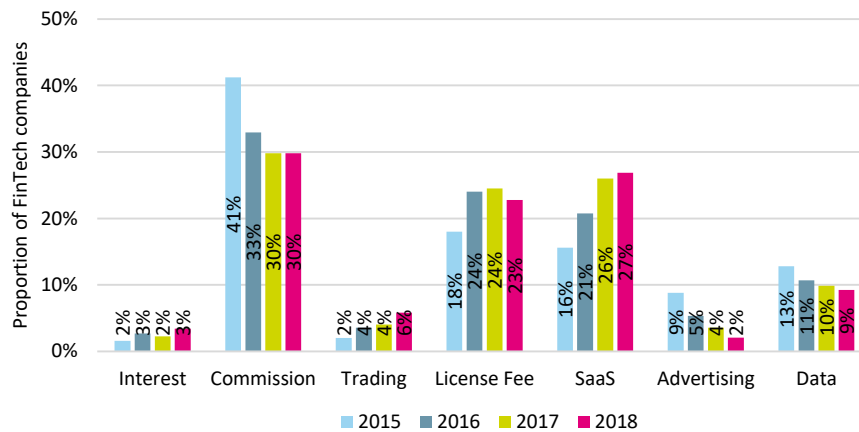


Figure 6.12: Proportion of FinTech companies by revenue model (n₂₀₁₈=311)

has been steady at 30 percent in the past two years, interest and trading revenue models, the two other traditional sources of income in the financial industry, have slightly gained in relevance, although they remain at an overall low level. From the revenue models typically pursued in the IT-sector, only the SaaS model was able to increase its proportion. License fees, on the other hand, lost one percentage point. The remaining two revenue models, i.e. advertising and selling (analysed) data, have continuously lost in relevance over the past years.

To summarise, the Swiss FinTech sector has grown significantly in 2018. By the end of the year, a total of 356 FinTech companies were active in Switzerland, implying a year-to-year growth rate of 62 percent. The sector has not only grown but also continued to mature, as underlined by the average number of FTEs employed at Swiss FinTech companies, as well as their capitalisations. The evaluation of their revenue models revealed that the trend towards an increased international orientation has continued in the past year. In addition, the majority of Swiss FinTech companies predominantly provide solutions for businesses using both digital and personal interaction channels and follow either a commission model or technology-driven revenue models such as license fees or SaaS.

6.2. Sentiment Analysis of Swiss FinTech Companies

By Prof. Dr. Thomas Ankenbrand & Denis Bieri,
Institute of Financial Services Zug IFZ

In last year's study we introduced a sentiment survey among Swiss FinTech companies in order to evaluate a selection of challenges faced by the sector. The average results of the surveys conducted in the years 2017 and 2018 are given in the sentiment spider in Figure 6.13, on a scale from 1 (not pressing) to 10 (highly pressing).

As in the year 2017, finding customers (average value of 6.5) is considered the greatest challenge for Swiss FinTech companies, followed by the availability of skilled staff or experienced managers (6.3), the costs of production or labour (5.6), regulation (5.5), expansion to international markets (5.5), competition (4.9), and access to financing (4.9). Comparing the results of 2017 and 2018 shows that the largest year-to-year difference is accounted for by difficulties in raising funds (+0.70). Again, companies in the field of *Distributed Ledger Technology* are the main drivers of this development due to the increasingly negative sentiment in the market for cryptographic assets associated with difficulties regarding raising funds via initial coin offerings. The availability of the required workforce is also evaluated as notably more challenging than in the previous year (+0.54). The changes of the remaining five challenges

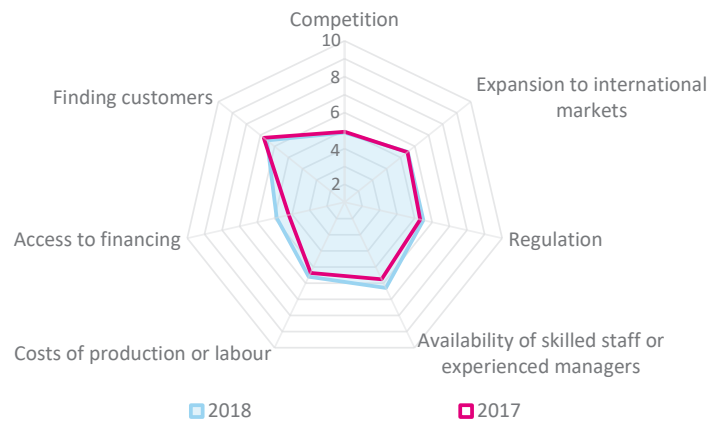


Figure 6.13: Challenges of FinTech companies (n₂₀₁₈=149)

range between +0.23 (costs of production or labour) and -0.24 (finding customers).

There are multiple possible reasons why finding customers is challenging for FinTech companies. As stated in a report from Capgemini and LinkedIn (2018), the two greatest challenges FinTech companies face while looking for a traditional financial services firm as a partner, which is of particular relevance in the B2B segment, include the lack of agility of traditional firms and their willingness of partnering. Further challenges include the cultural fit, regulatory burden, and IT compatibility. Key factors for successful collaboration include leadership buy-in and commitment on a C-level, common objectives, and common visions, as stated by the majority of the FinTech companies included in the report's survey (Capgemini & LinkedIn, 2018).

6.3. Analytics

*By Prof. Dr. Fabio Sigrist,
Institute of Financial Services Zug IFZ*

In the following sections, we give an introduction to analytics, show current trends and developments, highlight some important success factors for applying analytics in practice, and present an outlook.

6.3.1. Description & Current Developments

Analytics and machine learning remain high on the agenda of many companies and receive a lot of attention in the media. Major breakthroughs have been

made in the last years in areas such as image processing, natural language processing, and games such as Go (Mnih et al., 2015), where human-level performance was achieved or surpassed (Chollet & Allaire, 2018). Figure 6.14 illustrates the development of Artificial Intelligence (AI) and machine learning over time and highlights some of the major breakthroughs. These successes were made possible thanks to a combination of large amounts of data and a growing amount of inexpensive computational resources. Deep learning (Goodfellow et al., 2016) is one of the key types of algorithms that helped make fast progress in tasks such as image and speech recognition or translation. Recently, promising applications of deep learning have also been made in the area of finance. Buehler et al. (2018), for instance, successfully applied deep learning to the task of hedging. Gu et al. (2018) use deep learning for asset pricing. Essentially, deep learning is a broad collection of algorithms that consist of neural networks. Neural networks are flexible models that can learn general patterns. From a theoretical point of view, neural networks are characterised by the fact that they can approximate any function (see Hornik et al., 1989). Most of the major successes in deep learning have been observed for unstructured data which consists of data types such as text, images, or videos.

However, structured data is and will continue to be an important data source for many companies. The term structured data refers to "data collected and organised in a table format with columns representing different features (variables) or target values and rows repre-

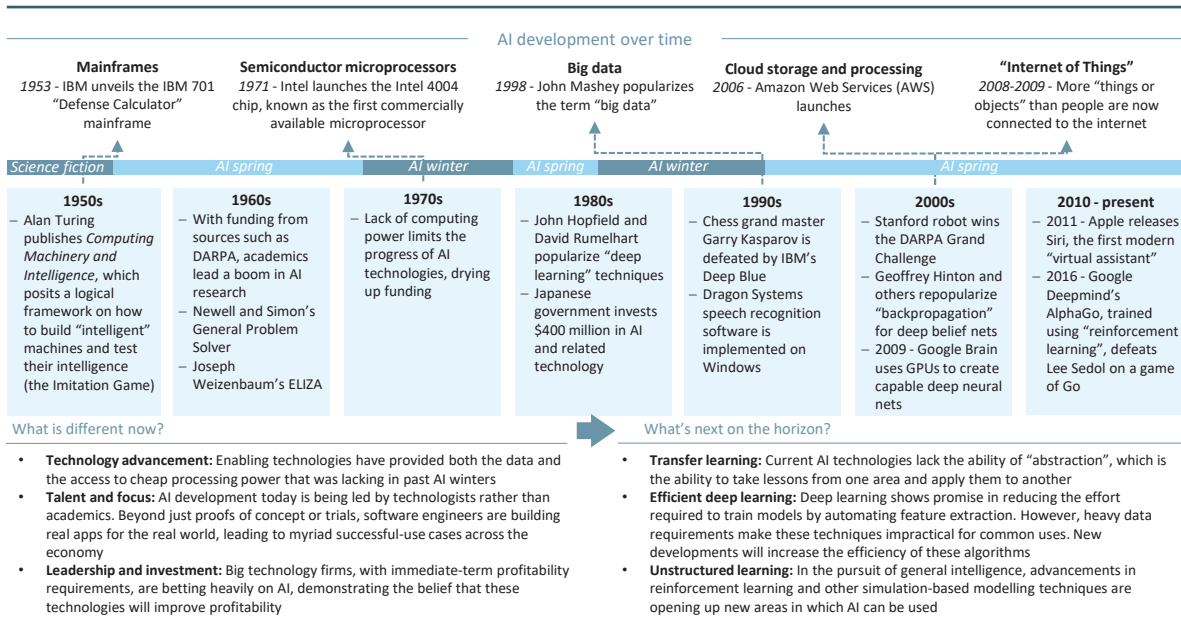


Figure 6.14: Development of AI over time (Source: McWaters & Galaski, 2018)

sending different samples" (Guo & Berkahn, 2016). This is often also called tabular data. It is likely that in the future, unstructured data will become more important, with more and more applications combining both traditional structured data and unstructured data. Deep learning can then be used as a tool for (pre-)processing unstructured data such as text, whose output is then further modelled jointly with tabular data.

One of the difficulties that analytics and machine learning currently face are wrong expectations (Vlae-

minck, 2018). Success stories from deep learning should not obscure what currently can and what cannot be achieved with machine learning. Overly positive media coverage can lead to both unrealistic expectations by managers about the business value of machine learning and also to rejection by employees, who fear that they will soon be replaced by AI. In the words of McWaters and Galaski (2018, p. 9): "Sensationalism risks dampening the benefits that AI could bring to financial services, while exacerbating harms". To illustrate this, Figure 6.15 shows a collection of typ-

Tremendous excitement is driving today's «artificial intelligence moment»

Significant cross-industry investment

~\$58 billion
Global AI investment by 2021

Sustained and strong investment growth

48% CAGR
Global cross-sector growth in AI investment through 2021

Tepid but significant investment from financial institutions

~\$10 billion
Investment in AI by financial institutions by 2020

A top priority for financial services executives

76%
of banking CXOs agree that adopting AI will be critical to their organisation's ability to differentiate in the market

However, the excitement is also coupled with significant uncertainty

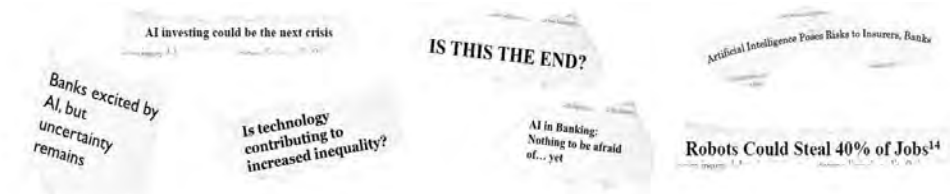


Figure 6.15: Typical newspaper headlines on machine learning and AI (Source: McWaters & Galaski, 2018)

ical newspaper headlines on machine learning and AI. To date, machine learning and deep learning are far from achieving a level of intelligence that humans have. In the following, we highlight a series of challenges. First, deep learning needs a lot of data in order to be successfully applied. This limits its application in many areas. In addition, deep learning and machine learning models are generally heavily domain dependent. In contrast to humans, their ability to transfer knowledge from one task to another one is still very limited. Furthermore, a machine learning model “does not know what it does not know” and it will in most cases give no warning when not to trust its predictions. This obviously severely limits its use in mission critical applications. Another point is that machine learning is far from being automated. A model cannot just be deployed “and learn everything by itself”, despite the fact that there are several frameworks for automated machine learning (Feurer et al., 2015).

Added Value of Analytics

Financial companies can gain an added value from analytics and machine learning in two ways: reducing costs and increasing revenue. First, analytics can help to (partially) automate processes. This in turn allows for scaling and reducing costs. On the other hand, machine learning can be used to make more accurate predictions and better decisions. Often, the benefit of machine learning is a combination of the two.

As an example, banks can use machine learning in their lending process. Depending on the client, the amount of the loan, and the complexity of the operation, the credit process can be automated with a direct impact on operational costs (Feingold, 2018). Furthermore, machine learning can discover patterns in the data, which cannot be found by humans. It can thus help to make better credit decisions, even in cases where it is not possible to fully automate the credit decision. For instance, a credit analyst can base a final loan decision on both his knowledge and expertise, as well as on an automatically generated rating made by a machine learning solution. If there is a divergence between the human and the machine assessment, this can be considered as a warning signal that the credit analyst might have missed an important piece of information, or vice versa. Such a collaboration between human and machine can thus help to reduce non-performing loans, which has an obvious impact on profitability. Compliance is another

area where banks can reduce costs by applying analytical solutions. In particular, to comply with a growing body of regulatory requirements, banks can rely on the development of tools in the field of RegTech (Feingold, 2018). These can be used for, e.g. fraud detection or for internal processes of risk supervision.

What is Analytics? A Definition and Explanation of Some Commonly Used Terms

Analytics is the process of examining data to gather useful information, which can then be used to make better business decisions. One commonly used definition of analytics is the following one according to Davenport and Harris (2007, p. 7): “Analytics is the extensive use of data, statistical and quantitative analysis, explanatory and predictive models, and fact-based management to drive decisions and add value.” As analytics is applied in many diverse industries, the following terms are often used almost interchangeably to denote analytics: data mining, data analytics, advanced analytics, business analytics, web or online analytics, or big data analytics.

Data analytics can be categorised into descriptive, predictive, diagnostic, and prescriptive analytics (see, e.g. Maydon, 2017). Figure 6.16, as well as Table 6.1, describe these different types of analytics. As the description shows, many analytics use cases in areas such as descriptive analytics and diagnostic analytics do not necessarily involve advanced machine learning methods. This illustrates that a lot of business value is also generated with traditional data mining or business intelligence (BI) techniques, although they are currently often rebranded as AI or machine learning.

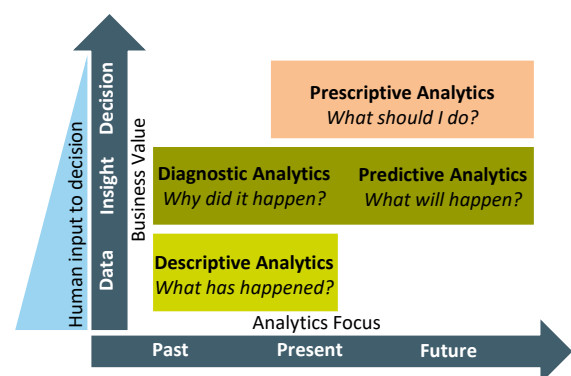


Figure 6.16: Four types of analytics (Source: IBM Corporation, 2015)

| Type | Description |
|-------------------------------|--|
| Descriptive analytics | <p>For descriptive analytics, the goal is to collect data and analyse what happened in the past.</p> <p>The main processes for descriptive analytics are data gathering, data visualization, and descriptive statistical analyses. This type of analytics is often also referred to as business intelligence (BI), and it can be done, e.g. with online analytical processing (OLAP) tools.</p> <p>Typical use case: Understand which customers are the most profitable ones.</p> |
| Diagnostic analytics | <p>For diagnostic analytics, the goal is to understand why something happens.</p> <p>Here, the goal is not only to analyse data and find patterns or to predict certain events, but also to shed some light on the reasons why certain events happened or why one finds certain patterns in the data. This type of analytics is also often referred to as business intelligence (BI).</p> <p>Typical use case: Understand the reasons for the cancellation of, e.g. an insurance policy or a mortgage at a bank.</p> |
| Predictive analytics | <p>For predictive analytics, the goal is to know what will happen in the future.</p> <p>Machine learning and AI models are used to forecast behaviour or outcomes in the future. Examples for typical applications are the prediction of default risk or the probability of a customer to “churn”.</p> <p>Typical use case: Identify customers that will cancel their customer relationship.</p> |
| Prescriptive analytics | <p>For prescriptive analytics, the goal is to understand what one should do in order to achieve a desired results.</p> <p>This includes experimental design to find causal relationships, as well as optimization techniques. In many cases, a strong interaction between algorithms and humans is required: algorithmic tools can recognize patterns and people with expert knowledge are able to interpret these patterns.</p> <p>Typical use case: Decide which products should be recommended in order to achieve the maximal profit, in contrast to simply recommending products that are most likely to be bought by a customer.</p> |

Table 6.1: Four types of analytics

What complicates communication in the area of analytics is the amount of different terms used to denote similar things: machine learning, statistics, AI, data science, and data mining, to name a few. While some of these terms denote precise scientific fields in academia, they are often used indiscriminately in practice for business applications. In the following, we give definitions of these terms and point out potential differences.

In business applications, data science is used almost interchangeably with (business) analytics. If there is a difference, then the term data science is used in situations where one wants to highlight a focus on complex methods, algorithms, and data structures. Both analytics and data science use techniques and methods from the fields of machine learning, statistics, and AI.

Both machine learning and statistics have the goal to create algorithms and models that can learn from data in order to make data-driven predictions and decisions. Historically, the older field of statistics has its origins in mathematics, whereas its more recent sister field of machine learning was derived from computer science. Machine learning and statistics include techniques such as clustering, classifications, regression, dimension reduction, text mining and sentiment analysis, natural language processing, and network analysis.

Artificial Intelligence is a very general field that, technically, also encompasses machine learning. Broadly speaking, the goal of AI is to create algorithms that are capable of intelligent behaviour. In contrast to the purely data-based approach of machine learning, AI additionally relies on rule-based programs that are

not necessarily trained by data. However, nowadays AI is used as a synonym for machine learning in most cases.

The term big data is often used in combination with analytics. According to Schroeck et al. (2012), big data can be broken down into the four V-dimensions: volume (scale of data), velocity (speed of arrival of new data), variety (different forms of data), and veracity (different data quality). The latter is related to the relevance of the data. Volume is often the most important dimension. Big data is conceptually the same as normal data, except that it cannot be handled and processed using standard data management tools and processes. This means that the challenges of big data often lie in setting up an adequate IT infrastructure and data management system that collects and stores data from various sources and uses computational power to process the data. A key difficulty when dealing with big data is to separate noise from signals. Unavoidably, big data contains a lot of data which is not relevant. This poses the danger of finding artefacts and drawing wrong conclusions based on fake and random results. Figure 6.17 graphically illustrates that the proportion of irrelevant data in relation to the relevant data is expected to grow in the future as more and more data is gathered.

6.3.2. Market Participants in Switzerland

Companies that are active in the Swiss FinTech analytics market offer a very diverse palette of solutions ranging from the applications of machine learning techniques to data management systems. In total, we currently count 34 active participants in the Swiss market that operate in the *Analytics* product area. Most of the participants that revealed information on their business models operate in the B2B segment (23). Six of the *Analytics* providers offer solutions in both the B2C and B2B segment. Only four companies are active solely in the B2C market. A large share of all companies (32) do not operate solely in the Swiss market, but also on the international market.

The participants covered in our survey use analytics and machine learning to provide the following services, among others:

- Automated trading or investment advice (*ACATIS, Calfor Finance, FinGraphs, Finhorizon, Flink AI, Sentifi, Tensor Technologies, theScreener, Trendrating*)
- Risk assessment and management (*Ariadne Business Analytics, Cfinancials, Edge Laboratories, Fractal Labs, Impaakt, LumRisk, Polixis, Riskifier, SwissMetrics, swissQuant, Utluna*)

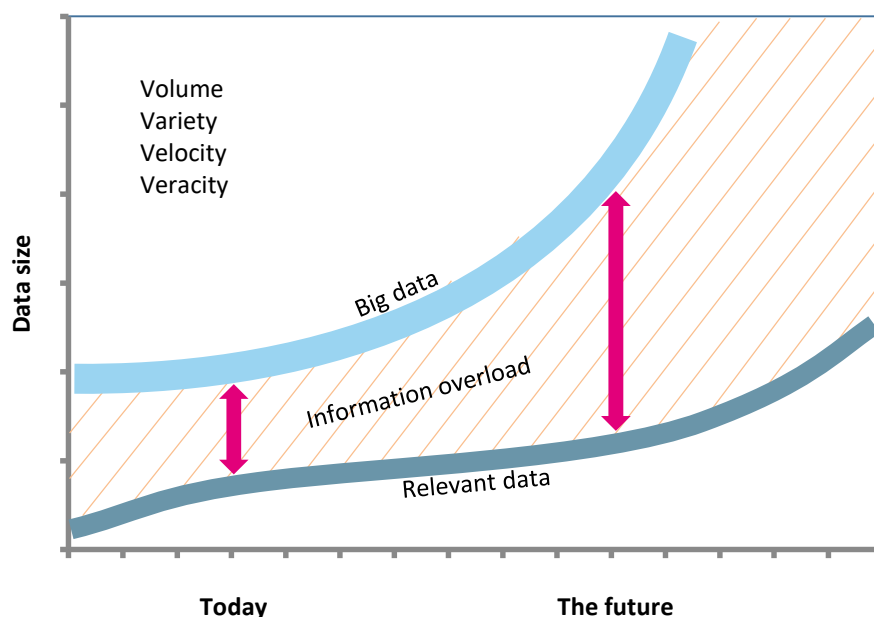


Figure 6.17: Illustration of the use of big data (Source: Sogeti, 2013)

- Customer relationship management (*ex indicis, Squirro*)
- Fraud detection (*NetGuardians*)
- Corporate finance (*Run my Accounts*)
- General purpose machine learning and deep learning solutions (*Inpher, NNAISENSE, nViso*)
- Data integration and data handling (*Canopy, onedot*)
- Data visualisation (*Veezoo*)
- Chat bots (*Enterprise Bot, Spitch*)
- Investment platforms (*Ground Up Project, Pexapark*)

The above list shows that many FinTech companies in the field of *Analytics* are active in the area of automated trading or investment advice. *ACATIS*, for instance, uses AI and deep learning to manage investment funds. They use text data, in particular balance sheets, to automatically discover patterns in order to identify stocks that will outperform the market. *Trendrating* provides momentum models, analytics, and software. The goal of their momentum model is to capture key trends earlier and filter out price noise, which can help to strengthen and complement the investment decision process. A further example is *Calfor Finance*, which offers automated sentiment-based trading solutions, as well as decision-making tools for financial analysts, wealth managers, and traders. This is made possible by using large amounts of data and techniques from natural language processing, a sub-field of machine learning.

Another area with a large amount of market participants is risk assessment and management. *Polixis*, for instance, specialises in emerging markets risks and compliance. They have the goal to blend human expertise with machine intelligence and emerging markets' big data. The result is a solution that aims to change the way risk and compliance teams work on client and transactional due diligence. *NetGuardians*, a Waadt-based company with international presence, offers fraud and risk assurance solutions by leveraging big data to correlate and analyse behaviour across the entire banking system.

Further, customer relationship management is another area where analytics is applied for tasks such as cross- and up-selling or churn prediction. *Ex indicis*, for example, provides predictive models that map investors' digital footprint to their investment preferences and risk profiles. This allows companies to de-

liver personalised content and services to prospective clients.

6.3.3. Outlook

When properly applied, analytics holds great potential for generating added value for financial companies. It is therefore to be expected that the adoption of analytics and machine learning will continue to grow in the foreseeable future. However, current machine learning still contains a series of open challenges that need to be solved in the future in order for AI systems to be optimally applied in practice.

We have highlighted that one of the challenges posed for many machine learning applications is that models often “do not know what they do not know” and will often give no warning when not to trust their predictions. An estimate of the degree of uncertainty of predictions from machine learning models is therefore crucial for their use in critical applications. This allows a machine learning model to communicate when it is unsure about its prediction, i.e. “when it does not know something”. To date, this is an unsolved challenge. Statisticians have been doing uncertainty quantification successfully for more than a century. For many modern machine learning applications unfortunately, this is still too complex to be done in practice. Future research should thus focus on developing appropriate tools for uncertainty quantification.

Another important point for the successful application of AI is interpretability (Kilburn, 2018). Modern machine learning algorithms such as deep learning are often black box algorithms. This means that it is impossible for a human being to precisely understand why a model makes a certain prediction or decision. However, whenever humans are also involved in the decision-making process, interpretability is important. For instance, in credit risk management, a machine learning solution can help a credit risk analyst prioritise and to discover patterns and cases that might otherwise have been overlooked. In order for such a collaboration between humans and artificially intelligent systems to function successfully, we as humans aim to understand how and why an AI solution makes a prediction. Despite some promising research in this area (e.g. Doshi-Velez & Kim, 2017), we are currently far from having systems that are both interpretable and highly accurate.

6.4. Banking Infrastructure

By Prof. Dr. Thomas Ankenbrand & Denis Bieri,
Institute of Financial Services Zug IFZ

FinTech is a relevant part of the financial service ecosystem, and important for its continuous development and renovation (Kyora et al., 2018). In other words, FinTech is the innovative spearhead of digital banking (Ankenbrand et al., 2018). The product area *Banking Infrastructure* is closely related to the banking business and is therefore the field which has been integrated into the core banking systems the most. It is sometimes difficult to distinguish it from digital banking programs in general. Most traditional core banking software and outsourcing providers are also very active in new technologies like cloud computing, AI or DLT (see section 5.4 for more details).

6.4.1. Description & Current Development

In our past editions of the IFZ FinTech study, the term “Banking Infrastructure” comprised a wide span of FinTech solutions like, for example, open banking (API), identity and security management, information & transaction platforms, personal and business finance management systems, and financial compliance systems. This series of items was slightly arbitrary and driven by the business models observed in the Swiss FinTech sector. In this year’s study, the product area *Banking Infrastructure* contains three sub-categories: User interface, processing enhancement, and infrastructure technology. A mapping of the new and old terminology can be represented as follows:

- User interface – Information & transaction platforms, personal and business finance management systems
- Processing enhancement – Identity and security management, financial compliance solutions
- Infrastructure technology – Open banking (API)

This new terminology is open for additional topics and consistent with traditional IT architectures. The differentiation from the information technology of the traditional financial services industry is based on our definition of FinTech in section 2.1, which requires FinTech solutions to exhibit a certain degree of innovation. The innovation degree is also reflected in the technological innovation of our newly introduced secondary FinTech taxonomy which includes the four layers *Process Digitisation/Automati-*

sation/Robotics, Analytics/Big Data/Artificial Intelligence, Distributed Ledger Technology, and Quantum Computing.

In the following, some current developments in the field of user interfaces, processing enhancements, and infrastructure technologies relevant to the financial industry are presented. Current trends in customer experience comprise (Capgemini & LinkedIn, 2018):

- Higher personalisation
- Increased speed of service
- Improved convenience (anytime, anywhere services)
- Intuitive interaction
- Better functionality
- Proactive insights

The user experience has generally been improved over the past years. Simple interfaces, ease of use, and free services already are or will be standard in modern financial service applications (McKinsey & Company, 2018a). But there is still more to be done in the area of personalisation, quick response (especially if the customer changes the channel), relevance, and seamless delivery (Capgemini & LinkedIn, 2018). The innovation is evolutionary and takes place in small steps. This often includes the seamless integration of different services and processes using different technologies and channels. A simple example hereof is the QR-bill, in which a QR-code contains all the payment-relevant data. This allows to simplify the invoicing processing and capturing the payment data with readers and smartphones (Payment Standards, online).

Especially companies in the *Process Digitisation/Automatisation/Robotics* layer of our newly introduced FinTech taxonomy offer processing enhancements, with automatisisation leading to lower costs and risks. But also companies in the other layers often aim to improve the efficiency of the financial industry. Regarding AI, Autonomous (2018b) expects a 22 percent cost reduction or about USD 1 trillion across financial sectors by 2030. In the banking industry the cost reduction is estimated at 25 percent and in investment management at 38 percent. The lowest reduction is expected to occur in the insurance industry with 14 percent of the traditional cost base.

Integration of solutions in the field of *Banking Infrastructure* often takes place via an open API or directly through an application. An example of such direct inte-

gration is the personal finance management solution *Contovista* in *Finnova's* e-banking solution (*Contovista*, online). An example of an API integration is the *avalooq.one* ecosystem (*Avaloq.one*, online). These integration paths are important for the further development because only 58 percent of the banks believe that the existing IT architecture and corresponding solutions are ready for the future. Hence, banks are aware of the threat posed by new platforms and applications (Ernst & Young, 2019). In addition, the new licensing category of FinTech companies by FINMA makes a direct access for FinTech companies to the Swiss Interbank Clearing (SIC) system possible (Swiss National Bank, 2019). This allows FinTech companies a direct integration into the existing banking infrastructure.

6.4.2. Market Participants

As illustrated in Figure 6.1, the product area *Banking Infrastructure* is the third largest of the six main FinTech categories. As of the end of 2018, 56 companies were active in the respective field, an increase by eight companies in comparison to the end of 2017. Of the total of 56 companies, two were founded in 2018. *Eli-gamo AG* is a secure cloud solution for an integrated sales and customer journey that combines simplicity, efficiency and customer experience. The second company is *Blockstate AG*, providing modular infrastructure in order to enable the issuance and the management of financial products. On the one hand, 14 companies which were founded prior to 2018 were newly included in the *Banking Infrastructure* category. On the other hand, eight companies were excluded from the product area due to the closure of their business or a shift in their business model away from *Banking Infrastructure* towards another (non-) FinTech product area.

6.4.3. Outlook

Outside of Switzerland we have seen how FinTech start-ups have begun to integrate more and more financial products on their platforms. An example is *Revolut*, also active in Switzerland, which started with a debit card with an aggressively priced multicurrency functionality. *Revolut* has recently received the European banking licence and is constantly expanding its product offering (*Revolut*, online). This new type of competitor, complete with a trendy style, force established market participants to increase their customer acquisition and retention costs, decrease their service prices, and to invest in technology to avoid lagging behind the new competitors in the dimensions of customer experiences and service efficiency.

Incumbent players in the financial industry also offer attractive FinTech offerings, with solutions like *Goldman Sachs' Marcus*, *Morgan Stanley's Access Investing*, *Merill Edge's Guided Investing*, *Deutsche Bank's Robin* (McKinsey & Company, 2018a), and others, or *Bank Cler* with *Zak* (the first Swiss mobile bank) as a national example. More and more of the incumbent players and start-ups are partnering, also in very early stages in accelerator or incubator programs to bring the best of the two worlds together. However, sales cycles are typically long (McKinsey & Company, 2018a) and finding customers is still the biggest problem for FinTech companies based on the sentiment analysis in section 6.2.

6.5. Distributed Ledger Technology

By Prof. Dr. Thomas Ankenbrand & Denis Bieri,
Institute of Financial Services Zug IFZ

The year 2018 has been subject to significant developments in the field of *Distributed Ledger Technology* (DLT). Besides decreasing prices in the markets for cryptographic assets, there have been multiple initiatives and activities by resident companies to implement DLT-related solutions and to add respective products and services to their offering.

6.5.1. Description & Current Development

The market for cryptographic assets has come under a lot of pressure in the year 2018. The total market capitalisation declined from roughly USD 830 billion on January 8 to USD 130 billion at the end of the year, implying a decrease of more than 80 percent (CoinMarketCap, online). At the same time, the ICO activity also decreased, not only on a global scale but also in Switzerland. Of the total of 1,072 ICOs globally (CoinSchedule, online) and the 15 ICOs of Swiss FinTech companies in the year 2018, almost two thirds were concluded in the first half of 2018. As mentioned in section 3.2.2, the general negative sentiment in the market for cryptographic assets, along with the increased regulatory awareness, at least partially, be responsible for the decline in ICO volumes. Regulatory uncertainty has also been one of the reasons that companies in the field of *Distributed Ledger Technology* had difficulties gaining access to banking relationships. In order to counteract this situation, the *Swiss Bankers Association* issued guidelines intending to help banks dealing with opening banking

accounts for blockchain companies, depending on the nature of the connection that the company has with DLT (Swiss Bankers Association, 2018b). In particular, companies in the field of DLT that do not seek to raise funds via an ICO should, in principle, not be treated differently than other SME customers who wish to open an account. For companies that raise capital for corporate purposes via a token sale, the guideline distinguishes between financing with fiat money and financing with other cryptographic assets such as Bitcoin or Ethereum. In the first case, KYC duties such as clarifying the source of funds and the beneficial owners apply as they do when opening a normal bank account. In the latter case, the guidelines recommend that the ICO organiser converts the raised cryptographic assets into fiat money through an entity regulated by Swiss law, e.g. an exchange for cryptographic assets or a third-party bank, before transferring the corresponding funds to the bank at which the account is held. In addition, the guidelines state that the ICO organiser should apply the KYC and AML standards applicable in Switzerland. In general, cryptographic assets should at least be treated as a cash transaction in the scope of an ICO (Swiss Bankers Association, 2018b).

Despite the fluctuations on the market for cryptographic assets and the developments around the issuance of new tokens, there have been considerable developments from Swiss-based FinTech companies focusing on solutions in the field of asset management for respective assets. In June, the *Vienna Stock Exchange* distributed the first index for cryptographic assets calculated by *LIMEYARD* and the Swiss FinTech company *Decentriq AG*. In the third quarter of 2018, the Zug-based *Crypto Fund AG* was the first company focusing on cryptographic assets to receive a licence as an asset manager of collective investment schemes from FINMA (NZZ, 2018). In November 2018, *SIX Swiss Exchange* listed the world's first exchange traded product (Valor symbol: HODL), managed by *Amun AG*, tracking the development of a basket consisting of five leading cryptographic assets (SIX, online (b)). The following month, an innovation partnership between the two Swiss FinTech companies *Avaloq* and *Metaco*, and the Swiss subsidiary of *Gazprombank* was made public. The partnership aims at providing a fully integrated solution for managing and storing cryptographic assets for the bank's clients (Avaloq, 2018). Already in September, *Dukascopy Bank* announced its plans regarding the launch of the

first ICO by a Swiss bank. The public sale of the *Dukascopy* is expected to take place in March 2019 (Dukascopy Bank, 2018). In addition, the start-up *Alethena* carried out a capital increase (via its parent company *Equility AG*), with the share capital being issued as a token, making bank deposits for the shares obsolete (Handelszeitung, 2018). A similar goal, i.e. the simplification of capital procurement and the management of owner shares for SMEs, is pursued by *daura*, a joint venture between *Swisscom* and *MME* founded in 2018.

Besides the developments related to the investment management of cryptographic assets, there have been enterprise activities focusing on streamlining established trading as well as clearing and settlement infrastructures by applying Distributed Ledger Technology. Table 6.2 lists a selection of DLT use cases of established financial infrastructure providers. Due to network effects needed for such solutions, Table 6.2 lists not only Swiss-based but also international initiatives. The use cases are categorised into three groups, i.e. access to capital, trade execution and post-trade services.

Solutions focusing on capital accessibility include DLT platforms to digitise shares and corresponding shareholder structures, as well as solutions for simplified financing and share management. Players active in this field include the *London Stock Exchange*, *NASDAQ*, the *Stock Exchange of Hong Kong*, and the *Korea Exchange*. Companies targeting DLT-based solutions in the field of the trade execution, the second main category of DLT use cases in capital markets infrastructure, aim at facilitating trading and storing (new) financial products. Projects in this segment were launched by *CME Group*, *Intercontinental Exchange*, *Singapore Exchange Limited*, *SIX Swiss Exchange*, and *Cboe Global Markets*. DLT-based post-trade services, as the third main category in Table 6.2, are subdivided into solutions concerning clearing and settlement, KYC, and proxy voting. Whereas the *Australian Securities Exchange*, *Euronext*, *DTCC*, *Deutsche Börse AG*, *Euroclear*, *TMX Group*, and the *Tokyo Stock Exchange* focus on streamlining clearing and settlement using DLT, the *National Stock Exchange of India* and the *Bolsa de Madrid* develop DLT-based accessing solutions of KYC data and identification networks. Finally, DLT-based e-voting systems are targeted by the *Moscow Exchange* and *Strate*.

| | | | |
|---------------------|--------------------------------|---|--|
| Access to capital | London Stock Exchange | Cooperation with IBM to digitally issue private shares of Italian SMEs and digitize shareholding structures | |
| | NASDAQ | LINQ – a platform that allows private companies to simplify share management and powers capitalization tables | |
| | Stock Exchange of Hong Kong | Plans to launch a blockchain-powered private market in 2018, aimed at helping early-stage and smaller firms obtaining financing | |
| | Korea Exchange | Launched Korea Startup Market in November 2016 with blockchain technology to enable equity shares of start-up companies to be traded in the open market | |
| Trade execution | CME Group | Provides a “fast, cost-effective, and cryptographically secure method” of buying, holding, and trading Royal Mint Gold | |
| | Intercontinental Exchange | Minority investments in digital currency exchange Coinbase | |
| | Singapore Exchange Limited | Exploring making trading and settlement of fixed-income trading more efficient with blockchain | |
| | SIX Swiss Exchange | Cooperation with NASDAQ providing DLT to SIX for a minimum viable product for its OTC structured products business | |
| | Cboe Global Markets/ CME Group | Launched bitcoin futures contracts in December 2017 | |
| Post-trade services | Clearing and settlement | Australian Securities Exchange | Using DLT to record shareholdings and manage the clearing and settlement of equity transactions in Australia |
| | | Euronext | LiquidShare for SMEs improving the transparency, speed, and security of post-trade operations |
| | | DTCC | Launching industrywide DLT platform for its trade information warehouse for cleared and bilateral credit derivatives by 2018 |
| | | Deutsche Börse AG | Prototype for the settlement of securities in delivery-vs.-payment mode for centrally issued digital coins or digital securities |
| | | Euroclear | Partnership with itBit to create Bankchain, a distributed ledger settlement service for the London bullion market |
| | | TMX Group | Development of a blockchain-based prototype to power a new service offering from Natural Gas Exchange to optimize the NGX gas settlement process |
| | | Tokyo Stock Exchange | Cooperation with IBM testing a trade confirmation prototype for trading and settlement in low liquidity markets |
| | KYC | NSE (National Stock Exchange of India) | Trial allowing participants to access KYC data information in real time |
| | | Bolsa de Madrid | Part of a Spanish multisector network developing blockchain-based identification network |
| | Proxy voting | Moscow Exchange | Developing e-voting for shareholders via blockchain |
| | | Strate | Agreement with NASDAQ to deliver an e-proxy voting system based on blockchain |

Table 6.2: Selection of DLT use cases in capital markets infrastructure (Source: McKinsey & Company, 2018b)

Apart from the cooperation between *SIX* and *NASDAQ* to develop a minimal viable product for *SIX*'s OTC structured products business, there have been additional DLT initiatives by established Swiss financial institutions. *PostFinance*, for example, launched a project for invoicing energy in a decentralised way

using DLT (PostFinance, 2018). A second example is *UBS* which is part of the *we.trade* consortium to apply DLT for a more efficient and cost-effective way to trade internationally, along with twelve non-Swiss banks (*we.trade*, online).

6.5.2. Market Participants

As of the end of 2018, 122 Swiss FinTech companies were active in the field of *Distributed Ledger Technology*, making it the largest product area in FinTech. Of the total 122 companies, 39 were founded in 2018, accounting for 68 percent of the total new incorporations in the FinTech sector in the corresponding year. The majority of the companies are located in and around the city of Zug, which has been recognised as the fastest growing Tech-hub community in Europe in the year 2018 (Atomico, 2018). Many of the newly founded companies do not primarily apply Distributed Ledger Technology, but provide complementary products and services such as investment, custody or mining solutions for the DLT sector. Another focus lies on providing enterprise DLT solutions, aimed at improving the efficiency of established processes and infrastructures in the financial services industry.

6.5.3. Outlook

DLT is often said to hold great potential to disrupt or transform existing business models in the financial industry, realise cost savings and to generate new revenue streams (see, for example, Accenture, 2016, or KPMG, 2018). It thus does not come as a surprise that more and more financial institutions implement DLT-based projects in order to evaluate the technology's potential. The ecosystem for cryptographic assets is also evolving rapidly, with an increasing level of integration into the traditional financial sector. A two-dimensional framework for evaluating the emerging trends in DLT is given by CB Insights (2018b). It takes into account the industry adoption of a trend, comprising signals such as momentum of start-ups in the space and media attention, and its market strength, including signals such as the market sizing forecast, the quality and number of investors and capital, and

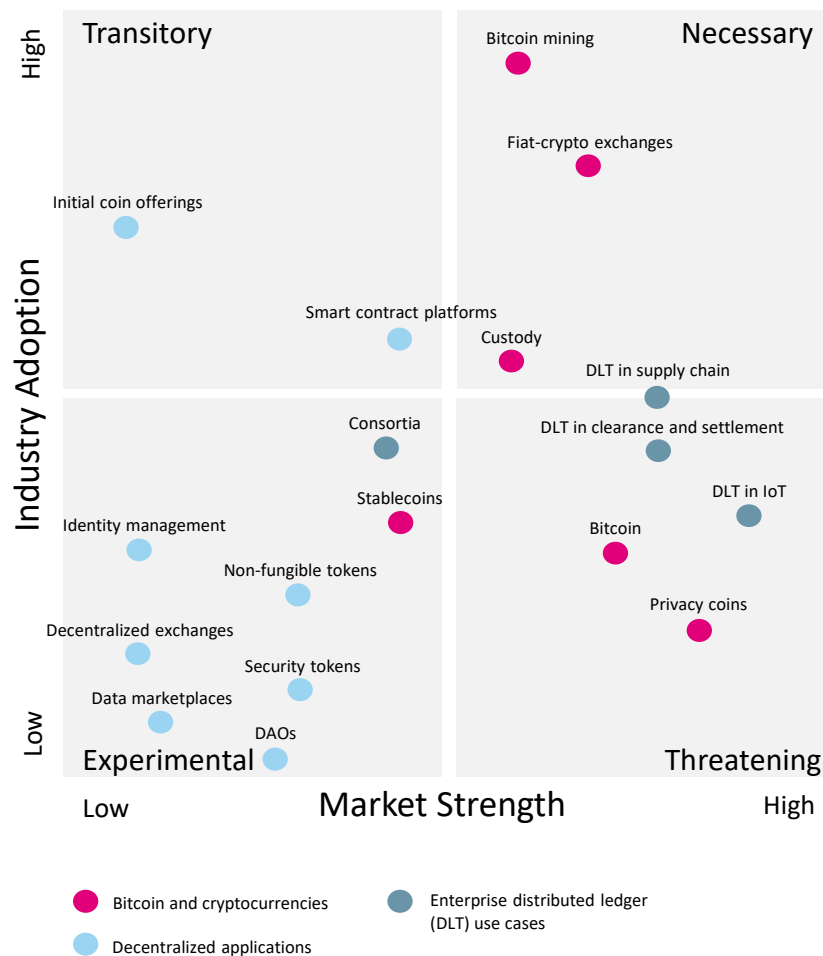


Figure 6.18: Trends in DLT (Source: CB Insights, 2018b)

the intensity of competition (CB Insights, 2018b). As illustrated in Figure 6.18, each of the 18 different DLT trends are classified into one of the three categories “Bitcoin and cryptocurrencies”, “Enterprise distributed ledger (DLT) use cases”, and “Decentralized applications”, and evaluated in the two-dimensional framework which distinguishes between the following four quadrants:

- **Experimental:** Trends with low adoption but spurring early media interest and proof-of-concepts
- **Threatening:** Trends that have been embraced by early adopters with the potential to gain widespread industry and customer adoption
- **Transitory:** Trends with sizable adoption, but with uncertainty about the market opportunity and size
- **Necessary:** Trends that are widely implemented and adopted and where markets/applications are understood

The evaluation reveals that most DLT trends concerning decentralised applications are still in a relatively early stage with a low level of adoption and low market strength, and thus fall into the “experimental” quadrant along with stablecoins and consortia solutions. The two exceptions are initial coin offerings and smart contract platforms in the “transitory” quadrant with a comparably higher level of adoption. Trends that have not (yet) been widely adopted but reveal a high market strength are Bitcoin and privacy coins from the “Bitcoin and cryptocurrencies” category and enterprise DLT solutions concerning clearing and settlement, supply chain management, and Internet-of-Things (IoT). According to the evaluation of CB Insights (2018b), there are only three trends, i.e. custody solutions for cryptographic assets, crypto exchanges with fiat gateways, and solutions for Bitcoin mining, which have both a sizable degree of industry adoption and also significant market strength. These three trends, which are all assigned to the “Bitcoin and cryptocurrencies” category, consequently fall into the “necessary” quadrant. Incumbents should thus have a clear, articulated strategy in order to effectively cope with the respective consequences on their existing business model.

6.6. Deposit & Lending

*By Simon Amrein & Prof. Dr. Andreas Dietrich,
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As a form of internet-based financial intermediation, crowdfunding is an integral part of financial technology. In contrast to traditional means of financial intermediation, for example through banks and stock exchanges, crowdfunding enables borrowers and lenders to interact directly.

Crowdfunding can be differentiated into various categories. From a FinTech perspective, only three categories are relevant: crowdlending, crowdinvesting (equity-based crowdfunding), and invoice trading. Within these three categories, CHF 345.7 million were invested in Switzerland in 2017. In 2016, the total volume invested was CHF 111.3 million (Dietrich & Amrein, 2018). Further rapid growth can be expected in 2018.⁸⁵

Besides the three crowdfunding categories that are relevant from a FinTech perspective, the last year showed the emergence and further growth of business models that focus exclusively on the intermediation of funds from institutional investors, corporates, public corporations⁸⁶, as well as cantons and municipalities. Platforms active in this area are often B2B-only (Business-to-Business). Compared to traditional crowdfunding, the corresponding loan is often financed by one party only (1:1 relationship).

6.6.1. A FinTech View on Crowdfunding

Crowdfunding is a method of funding campaigns online, where a number of entities provide funds for cultural, social, or commercial purposes. Communication between investors and borrowers is established through the internet and the role of the intermediary is assumed by the crowdfunding platform. The intermediary receives a fee for its services. This referral commission is often defined as a percentage of the amount raised. The funders receive either a monetary or non-monetary compensation in return for their investment.

⁸⁵ The new data for 2018 will be published in the *Crowdfunding Monitoring 2019*.

⁸⁶ In German: “Öffentlich-rechtliche Körperschaften»

As shown in Figure 6.19, the compensation for providing capital varies from a share of the profits of a company (crowdinvesting), interest income (crowdlending) to buying an invoice at a discount (invoice trading). In the case of reward-based crowdfunding, compensation for funders may take the form of products or services. Besides that, funding can also be provided without any direct and measurable consideration for the investment (crowddonating).

From the perspective of our definition of FinTech (see section 2.1), not every category of crowdfunding can be classified as FinTech, as the definition specifically emphasises “financial products or services”. For this reason, the focus is set on products and services that alter the financial intermediation process. In our case, this constitutes a potential transformation away from the traditional lending from banks and lending, as well as investing through stock exchanges, towards the internet-based model of crowdfunding. Reward-based crowdfunding and crowddonating do not meet these criteria. Crowdinvesting, crowdlending, and invoice trading, however, embody such financial services or products.

The definitions in Figure 6.19 also consider business models where private individuals are excluded as investors. Such B2B-only platforms (B2C would be also possible) target professional investors. Therefore, the

crowd does not consist of a large number of private individuals, but often only a small number of professional investors. In many cases, the funding only comes from one investor. This leads to a 1:1 relationship between the borrower and the lender (one borrower, one lender). In such a case, the traditional idea of crowdfunding as a 1:n relationship (one borrower, many lenders) becomes obsolete. For debt-based intermediation, for example, the term marketplace lending is more suitable. The following chapters and the market statistics focus on the traditional forms of crowdfunding, where a broader public (private and institutional investors) can fund campaigns. Other forms of business models are discussed in section 6.6.3. The different forms of crowdfunding are discussed in more detail in the following:

Crowdinvesting (equity-based crowdfunding) and real estate crowdinvesting

The aim of crowdinvesting lies in acquiring a stake in a company via equity or mezzanine capital, as opposed to funding a project. The companies subject to investment are often in an early stage of their life cycle. In return, funders receive shares in the company or a profit-linked compensation in the case of mezzanine funding. In order to guarantee more freedom and flexibility in the decision-making process of the management of a company, voting powers are often restricted for many types of investments.

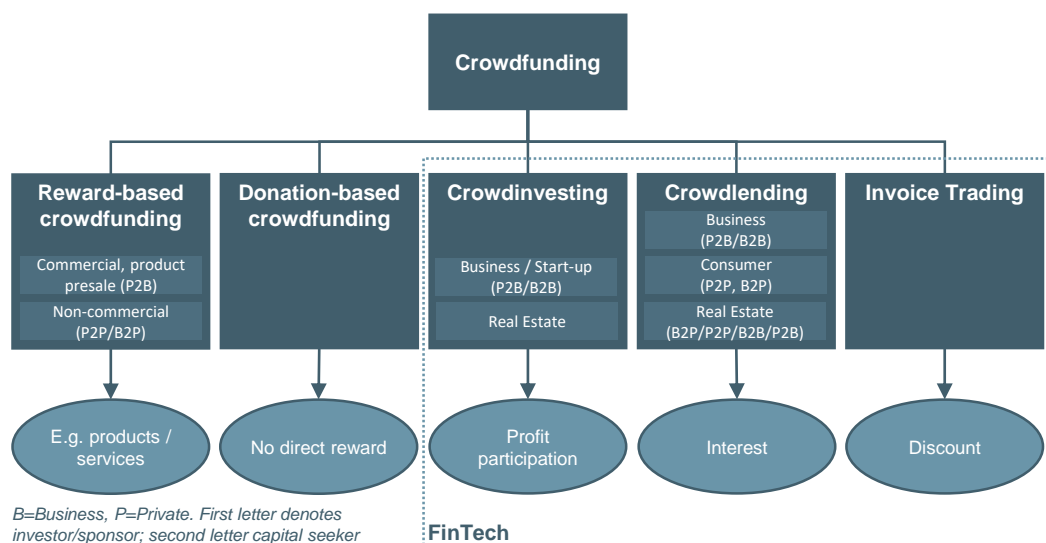


Figure 6.19: Crowdfunding taxonomy

Apart from the investment in companies, another form of crowdfunding offers the opportunity to engage in real estate. In this case, the investor becomes a co-owner of the property and/or land. The return on investment depends on the rental income from which the costs, such as operating costs, financing costs, or management costs are subtracted. The advantage of real estate crowdfunding is that investors can invest directly in (comparably small) shares of real estate. This was not possible before real estate crowdfunding became available. Investors traditionally would have had to invest indirectly, buying shares of real estate developers or real estate funds.

Crowdlending

Capital intermediated through crowdlending platforms is considered debt capital and can be divided into three different categories depending on the type of borrower. Firstly, companies – usually small and medium-sized enterprises (SME) – are able to seek capital via crowdlending. Secondly, private persons might borrow money to fund weddings or trips, for example. Thus, this subcategory of crowdlending is comparable to consumer loans. Thirdly, professional real estate developers, as well as private persons, might finance the debt part of their real estate using crowdlending. In all of these cases, individuals or firms advertise their need for borrowing over their personal profiles on a crowdlending platform. Private and institutional investors can view and fund loans directly through the platform.

By using crowdlending, investors are able to diversify their asset allocation with an additional fixed income asset class and have access to loans without having to go through the asset-backed security market or invest indirectly in financial institutions offering such services. Furthermore, crowdlending opens the above-mentioned asset class to smaller investors and constitutes a disintermediation of consumer and business finance using an electronic platform as a marketplace.

Crowdlending is also known as peer-to-peer lending (P2P) or marketplace lending. Whereas the first term emphasises the involvement of a large number of mostly private investors, the definition of marketplace lending is broader, as it also includes institutional investors. Even though many markets have developed into marketplace lending, the terms crowdlending and P2P lending are still frequently used.

There are two major trends that affect how the different terms are used. On the one hand, the role of institutional investors for crowdlending platforms has become more important over the course of the last two years. There is no data available for the share of institutional investors funding on Swiss platforms. In the leading lending markets (UK and USA), however, a majority of the funding comes from institutional investors (Dietrich et al., 2018). On the other hand, business models focusing on institutional investors exclusively entered the market. With such an evolution of the business models, the term crowdlending becomes increasingly outdated and many Swiss market participants prefer marketplace lending instead.

Invoice trading

Invoice trading enables firms to receive immediate liquidity by pre-financing their accounts receivable. The invoices are sold to the investors at a discount, following which the business receives funds to their account as an advance, at up to 90 percent of the invoice face value, usually within 24–48 hours.

6.6.2. Evolution of the Swiss Crowdfunding Market

In 2017, 374.5 million were raised across all crowdfunding categories in Switzerland, compared to CHF 128.2 million in 2016. CHF 345.7 million were collected through the FinTech-relevant categories of crowdfunding, crowdlending, and invoice trading. The following market analysis builds on the annual *Crowdfunding Monitoring Switzerland* (Dietrich & Amrein, 2018), which is based on a survey conducted among all active platforms in 2018.

Crowdfunding

There were 42 successful crowdfunding campaigns in 2017 (previous year: 25). The funds raised rose sharply from CHF 39.2 million in 2016 to CHF 135.2 million. As in 2016, the growth in the crowdfunding segment was primarily driven by the real estate category (see Figure 6.20). This category, which emerged in Switzerland only in 2015, had by 2017 already reached CHF 116.2 million in funds raised (previous year: CHF 32.3m).

The platform *Crowdhouse* was mainly accountable for the strong growth rates in 2017. However, three further platforms – *Crowdli*, *Immoyou*, and *Foxstone* – went online in 2017 and should have helped to drive growth in 2018. Minimum investment amounts for all

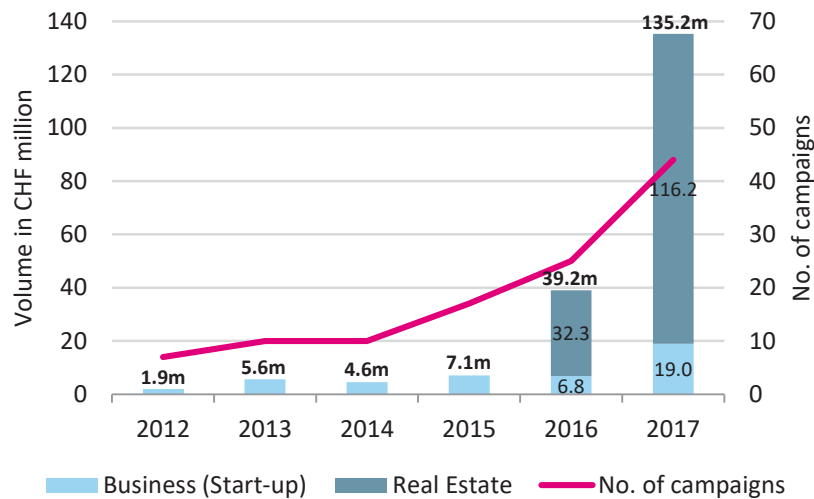


Figure 6.20: Crowdfunding volumes in Switzerland 2012–2017

four platforms are typically in the range of several tens of thousands of Swiss francs.

In the area of business crowdfunding, start-ups in 2017 received CHF 19.0 million (compared to CHF 6.8 million in the previous year). Investors backed a total of 18 start-ups. The platform *investiere* transacted the largest share of the funds raised.

Every crowdfunding campaign in 2017 was successfully completed. This is, not in the least, a result of careful project selection and professional project support on the part of the platforms. The average amounts raised vary greatly. They have risen strongly in real estate crowdfunding, due to the frequency with which larger apartment buildings are financed.

The crowdfunding category presents major differences between the various business models. *investiere*, for example, operates like a “business angels club”, where investors are screened before being accepted for admittance. Other crowdfunding platforms, such as *Bee Invested* and *Raizers*, have no access restrictions for investors.

The first real estate crowdfunding platform in Switzerland was launched in 2015 with *Crowdhouse*. The platforms *Crowdli*, *immoyou*, *Foxstone*, and *myBrick* went online in 2017. The platform *Crowdpark* went online in 2018.

Crowdlending

Fifteen crowdlending platforms were active in Switzerland by the end of 2018. The platforms focus mainly on one or two crowdlending categories (SME loans, consumer loans, mortgages). *Cashare* was the first platform to go online in 2008. Seven new platforms went live in 2016. They were joined in 2017 by *Acredius*, *Creditfolio*, and *Crowd4Cash*.

2017 and 2018 also witnessed the launch of the two platforms *Lendity* and *Impact-Lending*, that serve as a kind of “umbrella platform” to invest in loans on Swiss crowdlending platforms on behalf of institutional investors. These providers aim to offer a fund that invests in a basket of selected loans across a range of platforms. Moreover, the *1741 Group* launched a fund investing in loans on crowdlending platforms.

As shown in Figure 6.21, the crowdlending segment registered a volume of CHF 186.7 million in 2017 (previous year: CHF 55.1m). The number of successfully issued loans rose from 840 to 2,035. Of the CHF 186.7 million, CHF 111.6 million are accounted for by business crowdlending (loans for SME). The volume in this subsegment was CHF 28.1 million in 2016. The consumer crowdlending subsegment (loans for private individuals) also more than doubled (+116%) in 2017 compared to the previous year and now stands at CHF 52.0 million. Moreover, real estate crowdlending

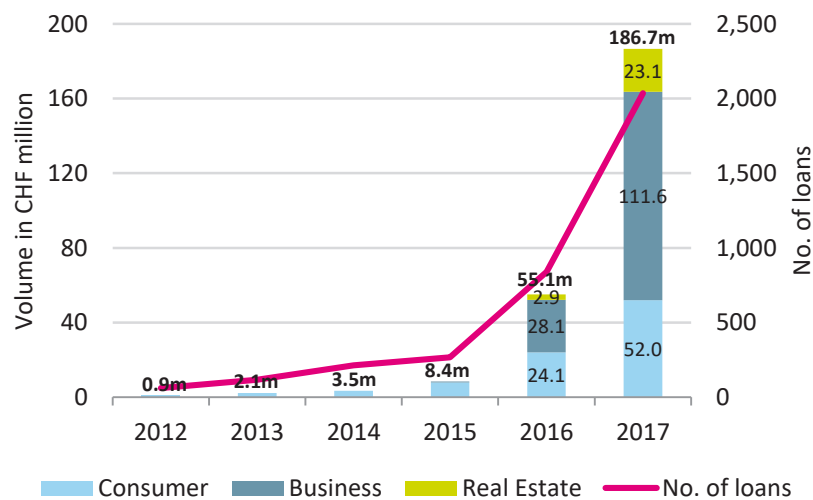


Figure 6.21: Crowdlending volumes in Switzerland 2012–2017

saw strong growth in 2017, during which CHF 23.1 million was raised.

The *Swiss Marketplace Lending Association SMLA* published aggregated loan volumes of its members for the first three quarters in 2018. Until end of September 2018, the *SMLA* members issued loans for CHF 119.3 million, indicating that the crowdlending market was most likely to continue to grow in 2018. This volume consists of SME loans (CHF 65m), consumer loans (CHF 30m), and mortgage loans (CHF 25m). The total number of loans during the first three quarters of 2018 was 1,206.

The average loan amounts vary greatly, depending on the type of loan. For SME, in 2017 the figure was around CHF 300,000,⁸⁷ a sharp rise compared to the previous year (2016: CHF 171,000). The largest transaction in this segment was a loan for an SME of CHF 8.7 million. In the case of consumer crowdlending, the average loan amount was around CHF 31,000 (2016: CHF 36,000). For real estate crowdlending, the average loan amount was CHF 854,000. Here, the largest transaction was CHF 7 million.

The introduction of the FinTech legislation in the summer 2017 reduced the hurdles for FinTech busi-

nesses and thus also for crowdfunding platforms. The changes affected the crowdfunding sector in two key areas. Firstly, the maximum period that funds can be held for settlement purposes has risen from seven to 60 days. This change had been welcomed by the sector, as it has significantly simplified the credit processes.

Secondly, the highly restrictive “20 lender rule” for crowdlending loans had been relaxed by raising the threshold to which it applies to CHF 1 million. This “20 lender rule” had, in a first step, only been lifted for loans to entities involved in “commercial-industrial activities”. While loans for SMEs met this “commercial-industrial” condition, those for private individuals did not. This changed in the beginning of 2019. In November 2018, the Federal Council announced that consumer loans could also be funded by more than 20 lenders, therefore abandoning the “20 lender rule” for consumer loans too (Federal Council, 2018b).

Invoice trading

The basic idea of invoice trading is to sell accounts receivable via an online platform. In that respect, the model is similar to that of the well-known principle of factoring. However, invoice trading differs from traditional factoring in respect to its degree of automa-

⁸⁷ The average amount does not include Advanon’s short-term loans.

tion, flexibility, and risk assessment. Traditional factoring providers (and banks offering this service) still typically process the invoices manually; this process is more standardised in the case of invoice trading platforms. Another key difference compared to conventional factoring is the direct link between sellers and buyers/investors of the invoices. Thus, invoice trading platforms assume no failure risk and do not offer liquidity. Instead, the platforms only intermediate accounts receivable. The recovery of the receivables falls to the seller of the receivables, not the invoice trading provider. That said, it should be noted that businesses can sell individual invoices at any given time. Flexibility is correspondingly greater in invoice trading than with factoring. Among others, the FinTech start-up *Advanon* offers a business model of this nature in Switzerland. All the following facts and figures have been provided by this one mentioned platform.

The invoice trading volume stood at CHF 23.5 million in 2017 (2016: CHF 17.2m), while the number of transactions rose from 600 to 1,500. The number of transactions is substantially lower than the number of funded invoices, due to the fact that invoices are typically bundled together to create individual transactions. These figures were provided by the platform *Advanon*. In partnership with the *Hypothekbank Lenzburg*, *Advanon* also operates the platform *Hypicash.ch*, and the platform *KMUCash.ch* in partnership with the *Cantonal Bank of Basel-Land*.

Tradeplus24 is another invoice trading provider. The platform only accepts funding from institutional investors. *Advanon*, however, announced a change in its business model in the summer of 2018. After being subject to a fraud case, in which a Swiss company allegedly sold open accounts receivable, the company decided to only accept institutional investors in the future. The faked accounts receivable amounted to CHF 2.4 million, with 78 private individuals being invested in these receivables (*Advanon*, 2018).

6.6.3. Alternative Lending Business Models

There is a variety of business models that are not included in the annual crowdfunding market overview above, because the business models are substantially different compared to “traditional” crowdlending business models. These “alternative” business models focus exclusively on institutional investors and usu-

ally intermediate substantially higher volumes. Especially business models focusing on debt-based intermediation have shown remarkable growth. Some of these start-ups are analysed in the following.

Loanboox is an online brokerage platform for public corporations and professional investors and went live in September 2016. From its launch up until September 2018, *Loanboox* has transacted loans of about CHF 6.5 billion (*Finanz und Wirtschaft*, 2018). Unlike typical crowdlending platforms, *Loanboox*'s business model has adopted a B2B approach, only accepting institutional and professional investors. The platform can be used by municipalities, towns, and cantons to fund loans ranging between CHF 500,000 and CHF 500 million. Institutional investors (but not private individuals) are then able to respond with their offers. The loans can be provided by one or multiple lenders. Until now, most loans have been provided by a single counterparty. *Loanboox* confines itself purely to providing broking services and only charges the borrower a one-off fee amounting to one basis point per year for the entire life of the loan. Lenders incur no costs. *Loanboox* expanded into Germany in 2017 and into Austria and France in 2018.

The bank *Vontobel* launched the platform *cosmofunding* in September 2018. *Cosmofunding* is open not only to fund public corporations, but also private companies. The platform cooperates with the Swiss rating agency *fedafin*, which provides ratings for the lenders. Only professional investors are admitted to the platform. Since its launch, the platform registered loan requests for about CHF 1 billion. The loans issued so far ranged between CHF 1 million and 100 million. The average loan size at *cosmofunding* was CHF 17.6 million with an average maturity of 2.9 years (volume-weighted average: 0.65 years).

Another example is *Remaco* with its corporate direct lending model. *Remaco*'s direct lending platform links businesses seeking capital with a circle of professional qualified investors. As an alternative to bank loans, businesses are able to source their capital via the *Remaco* platform.

Another platform for institutional investors is *instimatch global*. As compared to the platforms mentioned above, *instimatch global* focuses more on short-term transactions. It aims to transfer a part of the traditional money market to its platform. *Insti-*

match global does not only target institutional investors, but also large corporates that are trading their liquidity. The start-up opened its first office outside Switzerland in Amsterdam in September 2018.

6.6.4. Outlook

The crowdfunding categories of crowdlending, crowdinvesting, and invoice trading have shown remarkable growth rates in recent years. Compared to the traditional markets, for example for SME, consumer and mortgage loans, the volumes are still relatively small. It is interesting to see that the number of platforms is not growing rapidly anymore, whereas the total volume of the loans is still growing substantially. We also see that the market is maturing further. Moreover, the importance of institutional investors as a source of funding is increasing.

Apart from these traditional crowdfunding categories, new B2B-oriented marketplace lending business models emerged in 2017 and 2018. While the amounts raised via P2P models (Private-to-Private, e.g. consumer loans via crowdlending platforms) or P2B models (Private-to-Business, e.g. SME loans) are currently in the three-digit million range, B2B models already mediate volumes of several billion CHF. It would thus not come as a surprise if banks started to intensify their activities in the area of platform-based banking services.

6.7. Investment Management

By Dr. Jürg Fausch,
Institute of Financial Services Zug IFZ

Like for many other industries, the financial sector is undergoing a significant transformation in the way that financial services are provided to investors. The general trend towards digitalisation requires financial services providers to invest in new technologies and to adapt their business and operating model to meet changing customer needs in an increasingly technological world. FinTech start-ups, operating under low-cost, technology-driven business models pose a significant challenge to incumbent financial advisory and asset management firms.

6.7.1. Description & Current Developments

FinTech solutions in the field of digital investment management are broadly referred to as robo-advisors. However, due the diversity in their value proposition, no universally accepted definition exists. The overarching principle is to reduce human intervention and to utilise mathematical algorithms and quantitative models to find optimal investment strategies for clients and to support investment decisions (Kaya, 2017). In the United States the first robo-advisors or digital investment managers were founded in the aftermath of the global financial crises in 2008.

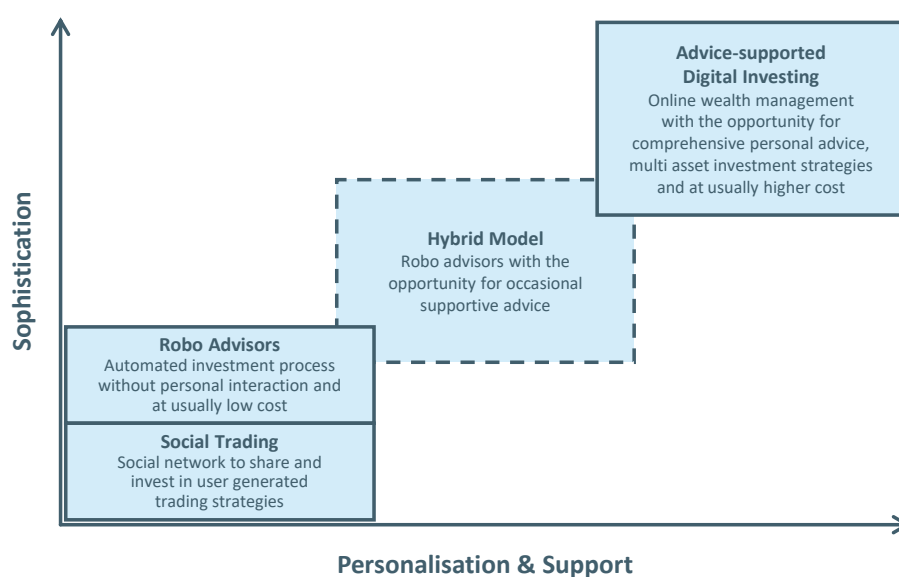


Figure 6.22: Classification and definition of business models

Their business model was built on mainly passive, automated portfolio management and asset allocation tools to serve the demand for relatively more automated and cheaper approaches to asset management (Phoon & Koh, 2018). Today, four business models can be identified in digital investment management. These business models vary in their degree of sophistication, as well as degree of personalisation and support. In order to classify these business models Dietrich et al. (2015) use a two dimensional classification approach (see Figure 6.22).

All the business models are based on elements of advisory service automation, but on different levels. The dimension “Personalisation & Support” on the horizontal axis measures the degree of personalisation of the investment proposal, the depth and breadth of the proposals, as well as the opportunity for personal advice. The dimension “Sophistication” on the vertical axis analyses the process of determining the risk profile, the user-friendliness and the information content of the website, as well as the sophistication of the investment process. In order to implement a digital strategy in investment management the most interesting model to adopt is potentially a hybrid approach where human interaction is complemented with Artificial Intelligence, machine learning, and other data analytics techniques to improve investment recommendations. This approach provides a degree of automated advisory services, but still includes regular physical client meetings and allows to meet customer needs in a flexible and comprehensive way, while digitising parts of the asset manager’s value chain. Currently there are two main types of robo-advisor platforms in the B2C segment. The first type consists of independent FinTech start-ups, while the second type are robo-advisor platforms from established asset management companies. In the United States, the two leading robo-advisor platforms, operated by FinTech start-ups *Wealthfront* and *Betterment*, manage assets of more than USD 10 billion and USD 13.5 billion, respectively. Among the traditional investment management firms *Vanguard’s Personal Advisor* with USD 93 billion assets under management (AuM) is the largest provider of robo-advisory solutions, followed

by *Schwab Intelligent Portfolios* with AuM of USD 19.4 billion and *Personal Capital* with AuM of USD 4.3 billion (Statista, 2018a). However, more recently, most of the largest traditional global wealth and asset management firms like *BlackRock*, *Merrill Lynch* or *Goldman Sachs* have implemented a robo-advisor strategy to retain clients and to develop new customer segments. In the US in 2017, 200 providers of digital investment management solutions managed more than USD 190 billion in assets on behalf of their clients (Statista, 2018a). From a global perspective, different forecasts predict that robo-advisory platforms will manage between USD 0.8 trillion and USD 8 trillion by the year 2020, which is about one to ten percent of the total global AuM (Statista 2018b; BI Intelligence 2017; KPMG, 2016). A more recent estimate about the growth perspectives of the robo-advisor industry indicates an annual growth of AuM (compound annual growth rate between 2018–2022) of 37.5 percent (Burnmark, 2018). In 2017 the global AuM of robo-advisor platforms amounted to approximately USD 230 billion, and the number of global users was 13 million (Statista, 2018b).

Digital investment management solutions are very often perceived as a low-cost, alternative to traditional financial advisory firms who follow a more active portfolio management approach. The platform charges an investment management fee that is a percentage of the AuM. However, these fees are very heterogeneous and vary among different platforms providers, as shown in Figure 6.23. In general, the fee structure of robo-advisors is very transparent and unlike many traditional financial services firms there are very often no minimum volume requirements for opening a robo-advisor account (Kaya, 2017). Robo-advisory firms in Switzerland charge on average around 0.75 percent, with a range between 0.50 percent and 1.25 percent, for managing a portfolio of up to CHF 100,000.⁸⁸ In the United States, a large-scale market for asset management services, robo-advisors are relatively cheaper and charge annual fees of about 0.30 percent on average with a range between 0.00 percent and 0.40 percent. In addition to the management fee, very often product related ex-

⁸⁸ It is important to note that most robo-advisory firms in Switzerland do not differentiate their fee structure with respect to the volume invested.

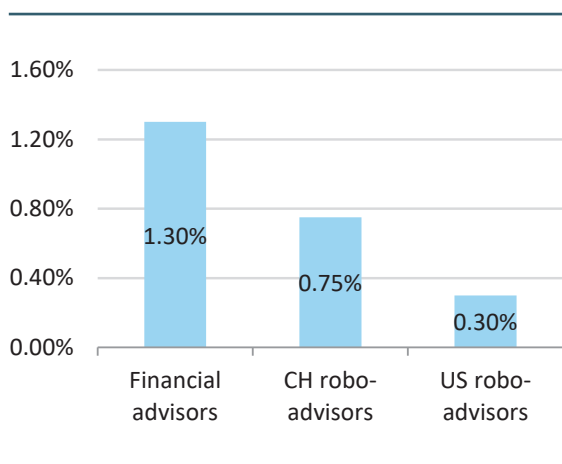


Figure 6.23: Average fees for 100,000 CHF investment

penses are charged to the customer. However, since robo-advisor platforms focus on passively managed exchange traded funds (ETFs) to implement their investment strategy, these additional product fees are usually quite low, and do not exceed 20 to 30 basis points on average. In comparison, a traditional financial advisor in Switzerland charges an average management fee of 1.30 percent for managing a portfolio of up to CHF 100,000, with a range between 0.65 percent and 1.95 percent.⁸⁹

A compelling body of research in behavioural finance indicates that investors make serious investment mistakes driven by behavioural biases. In particular, investors with lower cognitive abilities and lower levels of financial literacy suffer the most from these biases (Bucher-Koenen & Ziegelmeyer, 2011). In some cases, emotions like fear and greed can explain pricing bubbles and certain market behaviour. Over the last three decades, researchers have discovered a substantial number of biases that have an adverse impact on investment decisions. These findings include, among others, that due to loss aversion and mental accounting, investors sell winners too early and hold losers too long (disposition effect, Shefrin & Statman, 1985), experience overconfidence, which results in over trading (Barber & Odean, 2000) or hold under-diversified portfolios (Kelly, 1995; Goetzman & Kumar, 2008)

with a strong preference for local and home country stocks (Huberman, 2001). A more recent study from Bachmann and Hens (2015), using a representative sample of Swiss households, provides additional evidence that retail investors who are at the highest risk of making investment mistakes are those who are the least likely to seek help from professional asset managers.⁹⁰ Since robo-advisor algorithms are free of human emotions, most of the behavioural biases illustrated above are not present and robo-advice could have a positive impact on individual investors and enhance the quality of their financial decisions.

Moreover, due to its affordability and accessibility, less wealthy investors and investors with little financial knowledge would benefit to a larger extent from the advancement of robo-advisor services (Kaya, 2017). There is some empirical evidence that robo-advisors contribute to financial inclusion in the sense that financial advice matters most for households with low financial literacy levels. Moreover, research indicates that taking financial advice has a positive impact on the willingness to invest in risky assets (Georgarakos & Inderst, 2011). In this context, Scheurle and Hackethal (2017) show, based on data provided by a German bank, that inviting individuals to use robo-advice services did increase the propensity to enter the stock market by a factor of 1.8. From a policy makers perspective such an increase in stock market participation has an important implication with respect to pension savings. An allocation of savings funds towards riskier investments with higher expected returns could contribute to mitigate the problem of the inadequacy of pension savings and help individuals accumulate more retirement savings.

Another important factor when investors decide where to invest is related to portfolio performance. Since most robo-advisors use passively managed ETFs to implement their investment strategy, the performance of ETFs can be used as a first indicator to evaluate the performance of robo-advisor platforms. Kaya (2017) shows that over a period of ten years (2007–2017) actively managed funds struggled to outperform ETFs. Between 2014 and 2016, for exam-

⁸⁹ Management fees are retrieved from company websites and www.moneyland.ch.

⁹⁰ It is important to note that there is an ongoing debate whether expert financial advice truly benefits retail investors. However, there is evidence that portfolios managed by investment professionals are more diversified (Gerhardt & Hackethal, 2009) and exhibit weaker disposition effects than portfolios of retail investors (Shapira & Venezia, 2001).

ple, on average only 40 percent of actively managed funds were able to beat ETF returns. This implies that for most retail investors it might be hard to find an actively managed fund that sustainably outperforms a comparable ETF, in particular when fees are taken into consideration. In general, there is little empirical evidence about the performance of robo-advisors versus traditional asset managers. A recent study conducted by the independent investment consultant *ZweiWealth Experts* compared the performance of five Swiss robo-advisors with the performance of 200 traditional Swiss asset managers over a period of 30 months. For that purpose, 18 investment strategies with different risk profiles were compared. Over the observation period and after subtracting fees robo-advisors underperformed the market on average by two percent and traditional asset managers on average by one percent. This analysis shows that a strategic asset allocation is a necessary but not sufficient condition for sustainable investment success.

6.7.2. Market Participants in Switzerland

The Swiss market for digital investment management is still at an early stage. For instance, the AuM of all Swiss robo-advisor platforms are substantially below the leading US robo-advisor start-up *Betterment* (AuM of approx. USD 13.5 billion). Nevertheless, among 165 different robo-advisor companies in the world, 10 are located in Switzerland. Only the United States (60 companies), Germany (35), and the United Kingdom (24) harbour more robo-advisor platforms than Switzerland (Deloitte, 2017b). However, the number of digital investment companies in a broader sense is much larger. In Switzerland, by the end of 2018, 66 FinTech start-ups were operating in this area of the FinTech ecosystem. These companies develop software or maintain information platforms for institutional clients, provide financial data and risk management services, or offer consulting and advisory services related to digital investment management. Unlike most robo-advisory platforms, which are primarily active in a B2C market, these other FinTech start-ups operate in a B2B environment.

Scalable Capital, one of the largest robo-advisor platforms in Europe entered the Swiss market in the beginning of January 2018. At the end of 2018, the company managed AuM exceeding EUR 1 billion for more than 30,000 customers in Austria, Germany, Great Britain, and Switzerland. The company primarily operates in the B2C market, but also cooperates

with other firms like the German bank *ING-DiBa* or *Siemens Private Finance* and thus serves the B2B2C market as well (Scalable Capital, 2018a). Moreover, in November 2018 *Scalable Capital* started offering advice-supported digital investing for clients in Germany with financial wealth above EUR 100,000. In this context, investors are provided the opportunity to talk to financial experts about their overall financial situation and investment goals, as well as get comprehensive information related to digital investing (Scalable Capital, 2018b). This development provides anecdotal evidence that, in order to grow in the mass affluent market, a pure robo-advisor approach might not be sufficient and some degree of human interaction indispensable to build up a trustful client relationship.

As illustrated above, digital investment solutions contribute to financial inclusion, which is of particular importance when it comes to pension saving. In Switzerland, the pension system is built on three pillars. The first pillar is a state-run pension scheme, the second pillar is based on compulsory pension funds financed by both employers and employees, and the third pillar consists of voluntary pension schemes financed entirely by the insured person. The third pillar, called pillar 3a, is encouraged by the federal government and cantons through tax incentives. A recent study from Credit Suisse (2018) showed that 65 percent of the working population aged 25–65 use the option of tax incentivised retirement saving. However, over a third of the workforce in Switzerland do not contribute to a pillar 3a and in 2016 less than 23 percent of the funds were invested in stocks or other risk-bearing securities, despite these being more risky investments which would be more suitable for a longer investment horizon. In 2017, FinTech start-up *VIAC* introduced a digital pension solution with the aim to make pillar 3a saving easily accessible at low costs. The platform is accessed through a mobile app and all processes, from client onboarding to choosing an appropriate investment strategy and reporting, are completely digital. The company now serves more than 7,000 customers and allows to invest up to 100 percent of the funds in stocks (*VIAC*, online). The management fee amounts to 0.52 percent plus product costs of about 0.04 percent and is below the average fee charged by robo-advisor platforms in Switzerland. *VZ Finanzportal* is an incumbent financial advisor that has offered digital pensions solutions since 2010. However, compared to *VIAC*, the business model is based on a hybrid approach where computer

algorithms are complemented with the option of human interaction. Today the company has more than 15,000 clients (VZ Finanzportal, online) and offers, in addition to pillar 3a accounts, a digital investment platform based on ETFs, as well as rule based investing. The management fee for the pillar 3a is 0.68 per cent plus product costs on ETFs. Due to its simplicity and low costs, digital pension solutions could contribute towards workers in Switzerland accumulating more voluntary, tax incentivised retirement savings and investing larger part of these savings in more risky securities that offer higher expected returns.

The most recent development in the Swiss robo-advisor market is the planned launch of a digital asset management platform by *Vontobel* at the end of the first quarter in 2019. The robo-advisor is based on a smartphone app, which provides customers with the opportunity to invest in a broad variety of securities and topics. However, unlike existing robo-advisor platforms, the investment process is not fully automated, because the portfolio is managed by a human financial expert. This hybrid model from *Vontobel* thus intends to follow a more active portfolio management approach. Moreover, *Vontobel* considers providing the platform to other financial services firms as a white-label solution and as a tool to acquire new customers (Finanz und Wirtschaft, 2019). In addition to these examples, most established banks are working on digital investment solutions at various levels.

6.7.3. Outlook

In order to establish a profitable business in the long run, these robo-advisor platforms need to grow substantially with respect to their client base and AuM, and realise large economies of scale. Wong (2015) estimates that a robo-advisor in the US market needs approximately USD 16 billion to USD 40 billion in assets to become profitable. However, since the market for digital investing is projected to grow significantly in the future, established asset management firms or banks will enter the market and establish their own digital investment solutions. This increase in competition might have profound implications for robo-advisor start-ups, as they do not have the large client base traditional asset management companies can rely on. If incumbent asset management firms provide robo-advisor solutions at a larger scale and at the same costs as FinTech start-ups, investors might ask themselves why to invest with an unknown start-up if there is an opportunity to get the same service from

an incumbent asset management firm. This corroborates the view that it is important to gain a large market share before incumbents enter the market. However, increasing the customer base is expensive and requires large distribution efforts. While the use of algorithms and high-degree of automated processes allow robo-advisor platforms to charge lower management fees, it might be the case that these fees are too low to sustain the business model and cover the high costs of customer acquisition (OECD, 2017). For example, *Werthstein*, a Swiss based robo-advisor platform, had to terminate its business operations in Germany (Werthstein, 2018) and *UBS* sold the intellectual property rights of its robo-advisor platform *SmartWealth* in the United Kingdom to the US FinTech company *SigFig* (Financial Times, 2018). Another way to create a more sustainable business model in a competitive business environment is by combining forces and entering into cooperations and partnerships. In Switzerland, *Basellandschaftliche Kantonalbank (BLKB)* introduced *Digifolio* in 2017 as the result of a partnership with the Zurich-based robo-advisor platform *True Wealth*. The robo-advisor start-up benefits from an existing customer base of a cantonal bank while *BLKB* in turn can offer its clients a digital investment solution. Another more recent example of a cooperation is between the banking software provider *Finnova* and *True Wealth*. *Finnova* integrated *True Wealth's* robo-advisor solution into the *Finnova* banking software. This allows banks, operating under the *Finnova* software, to offer digital asset management services to digitally-savvy client segments. *Regiobank Solothurn* is the first *Finnova* bank to make this robo-advisor solution available to its customers (Finnova, 2018). According to the 2018 *Legg Mason Global Investment Survey* in a representative sample of Swiss investors ($N=1000$), 46 percent stated that they understand the term robo-advisor and in the next five years, 34 percent of Swiss investors intend to complement their portfolio by using robo-advisor platforms. When asked about what matters most when selecting a robo-advisor, 25 percent stated that the price/fees is the most important criterion, followed by ease of use and fee transparency/simplicity. However, the study also reveals that a majority of investors (69 percent), including tech-savvy millennials, agree with the statement that personal customer service with a "human touch" can never be replaced with technology (Legg Mason, 2018). This view corroborates the hypothesis that a combination of human advice and technology might be the future of investment management.

6.8. Payment

By Prof. Dr. Andreas Dietrich & Reto Wernli,
Institute of Financial Services Zug IFZ

The payment market has changed significantly over the past three decades. Digitalisation is constantly opening up new possibilities, which are now increasingly finding their way into the payment market. In countries such as France, Belgium, and the Netherlands, private households already pay for less than 30 percent of their expenses at the point of sale (POS) with cash (Esselink & Hernández, 2017). The penetration of card payments is more advanced in these countries than in Switzerland. However, the trend is also clearly noticeable in our country. In 1990, around 90 percent of the payment volume at the POS was processed with cash (Truetsch & Jaeger, 2016). Just under 30 years later, according to a representative survey by the Swiss National Bank (SNB), the figure was still 70 percent, as Figure 6.24 (light blue bars) shows. At almost 30 percent, the value share of the debit card (Maestro, V Pay, Postcard) is almost three times higher than that of the credit card.

Cash is still very popular in Switzerland. The Swiss population makes an average of 1.6 payments per day. Nearly 70 percent of these transactions are carried out with cash, while the credit card is only used for every twentieth payment. For small amounts of less than CHF 20, cash is still the most frequently used, accounting for more than 80 percent of all these transactions. This is somewhat surprising, since card payments for less than CHF 40 can be processed easily and without

entering a PIN, using the contactless function (NFC) (Swiss National Bank, 2018b). In addition to the partially limited acceptance of cards for small amounts, the preference for cash is probably also related in part to established habits of the Swiss population.

With the introduction of contactless card payment technology in 2014 competition increased for cash, even for small amounts. Figure 6.25 (right-hand figure) shows the annual number of credit and debit card transactions (indexed). Both rose by more than factor three, the largest growth rates in the last three years. The value of those transactions measured in Swiss francs has more than doubled since 2005 (Figure 6.25, left-hand figure). Particularly in the case of debit cards, there has been a marked acceleration in the frequency of use since 2014. Though the SNB survey (2018b) shows that cash is still used disproportionately often, especially for small amounts, the contactless function has made card payments even more popular in this amount category. This is also reflected in the fact that the average amount per credit card transaction in Switzerland in the first quarter of 2018, at around CHF 88, is about CHF 100 lower than twelve years earlier.

While at the beginning of 2015 only twelve percent of domestic credit card transactions were initiated via NFC, by September 2018 this figure rose to almost half. In terms of volume, the credit card share of the total transaction volume was still low, but rose sharply from three to 23 percent. This development shows that the Swiss are willing to adapt their payment habits if there is an obvious additional benefit – for ex-

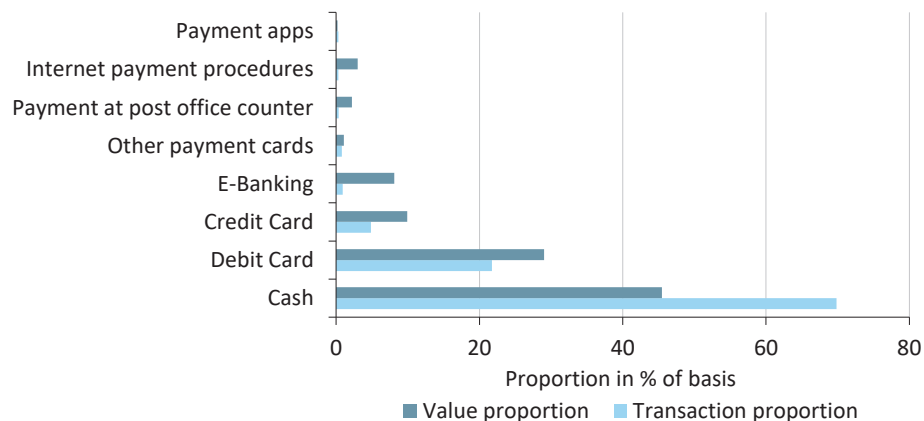


Figure 6.24: Transaction and value proportion per payment method (Source: Swiss National Bank, 2018b)

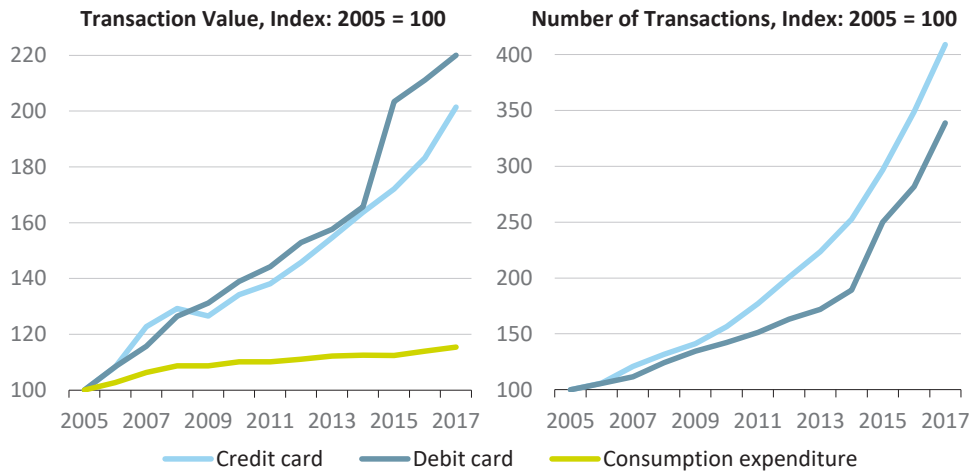


Figure 6.25: Consumption expenditure of private households and card transaction value (left-hand figure), and number of card transactions (right-hand figure) (Source: Swiss National Bank, 2018b; Federal Statistical Office, 2018c)

ample in the form of saving time. This raises the question of whether and how mobile payment has developed and will continue to develop in Switzerland.

6.8.1. Mobile Payment in Switzerland: Analysis of the Use of Twint

In Switzerland, various mobile payment solutions have appeared on the market in recent years. In addition to solutions such as *Apple Pay*, *Samsung Pay*, and *Revolut*, the most relevant market change from a Swiss perspective was the merger of *Paymit* and *Twint*. The new system, which is supported by the six largest banks, went live at the first banks in April 2017

and includes all three core functions of mobile payment solutions (POS, E-Commerce, P2P). For the following analysis, *Twint* provided exclusive data on the use of the *Twint* app. The data set for this analysis includes transactions between May 2017 and October 2018.

Registration of users by age and month

Twint had over one million registered users as of October 2018. Figure 6.26 shows the number of monthly registrations in thousands (columns) since May 2017, ranging from 34,000 – immediately after relaunch – to slightly more than 68,000 in November 2017. The

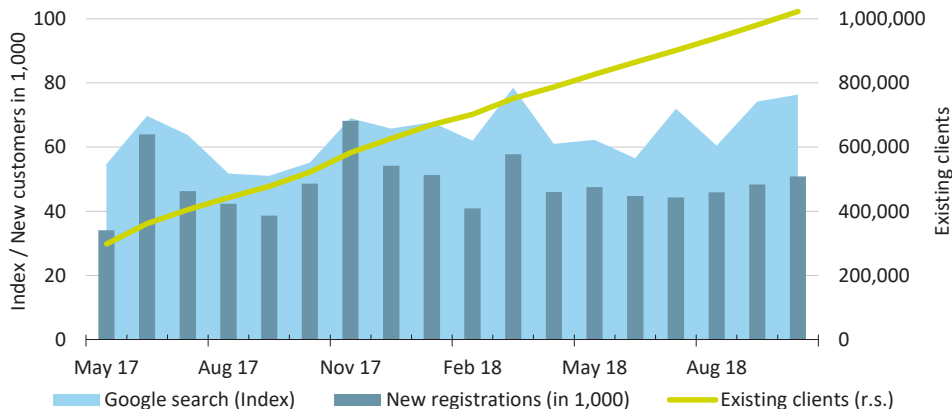


Figure 6.26: Number of new customers per month, Google search queries and existing customers (Sources: IFZ, Twint)

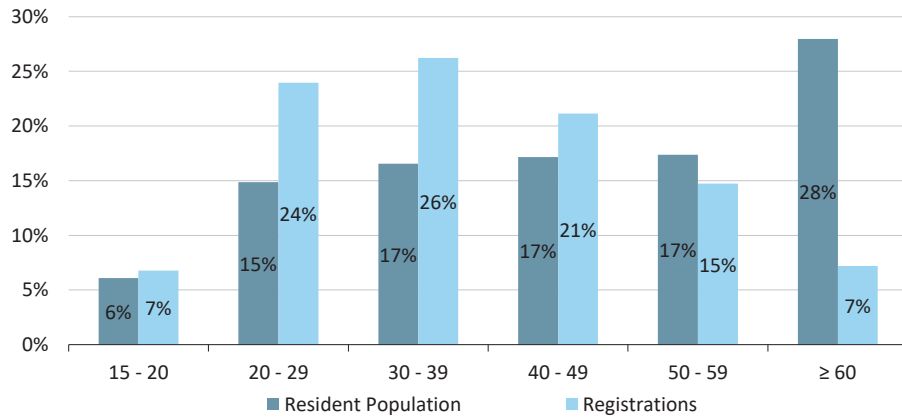


Figure 6.27: Distribution of registered *Twint*-users and resident population (15 Years and older) by age category (Sources: IFZ, Twint; Federal Statistical Office, 2017)

flattening out of new registrations in January, February and the summer months also correlates with the declining number of card transactions during these months. The graph also shows that the search queries on *Google* for the term “*Twint*” are clearly related to the number of new registrations. *Google Trends* indexes the search volume in such a way that the value 100 is reached in the week with the highest search volume. This peak was measured in the week of March 4, 2018, when *Twint* was mentioned several times in the media. The total number of registered users has more than tripled since May 2017 and exceeded the one million mark in October 2018.

The customer structure shows that mobile payment is currently used by more men than women, which is a typical phenomenon of adoption behaviour in technological innovations. Although the proportion of female users increased by eight percentage points within eight months, today only 34 percent of all mobile payment users are female. In terms of the age of the users, it is evident that mobile payment is not exclusively a topic for young users (see Figure 6.27).

The group of 20 to 40-year-olds is clearly above average in terms of the demography of the Swiss resident population. While this group makes up nearly one third of the permanent resident population as of 2016

(Federal Statistical Office, 2017), they represent almost half of the registered *Twint* users. Currently the largest user group is between 30 and 40 years old (26 percent). Around seven percent of registered *Twint* users are older than 60.

As mentioned at the beginning, more than one million people have already registered with *Twint*. If one excludes the approximately 1.4 million residents under the age of 15 from the population of 8.4 million, *Twint* has a market share of 13.1 percent in terms of registrations.⁹¹

Transactions

The number and volume of transactions show impressive growth rates. When looking at the number of transactions in combination with users, it should be noted that a considerable proportion of registered customers are inactive. Approximately one third did not carry out any transactions in the first ten months of 2018. Figure 6.28 shows that nearly one fifth of the registered active users made just one transaction via *Twint* in this period (the inactive registered users were omitted for this chart). The most numerous were the occasional users who made two to ten transactions (31%). One third of the active users used *Twint* more than once a month in the first ten months of 2018, while the average number of transactions during this

⁹¹ The minimum age for Twint is 12 years.

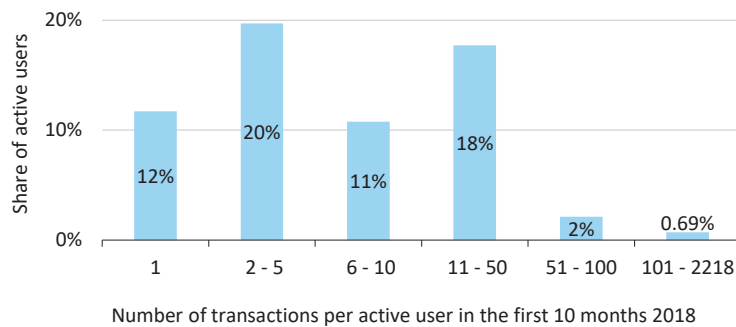


Figure 6.28: Frequency of use 2018 (Sources: IFZ, Twint)

period was at 12.81, with a maximum of 2,218 transactions. Half of all transactions were made by one tenth (10.7%) of the active users. 6,800 users thus counted for over a hundred transactions in only ten months.

Figure 6.29 shows that the average amounts vary greatly depending on the application. While an average of CHF 30 was transacted at the point of sale in October 2018, transactions were significantly higher in the areas of peer-to-peer transfers (CHF 76) and E-Commerce and M-Commerce (CHF 123). The average amounts have only changed noticeably over the past months at the point of sale. Here, the average amount of CHF 16 rose by 86 percent since May 2017.

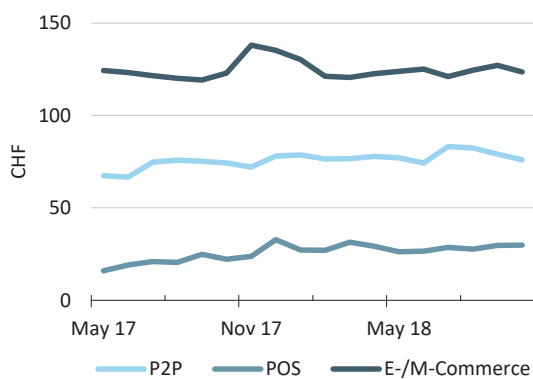


Figure 6.29: Average amount by transaction category (Sources: IFZ, Twint)

Across all application areas, the average transaction amount for *Twint*-users was CHF 64.

An analysis of direct transfers has shown that this payment option is primarily used for repaying money after restaurant visits or in connection with travel, for gifts, for tickets (cinema, sports, concerts) or normal household purchases. The amount of CHF 76 for P2P transactions, which is higher than most banks had originally expected, also shows that only “larger debts” tend to be repaid in Switzerland. Smaller amounts such as for the payment of a beer after work, do not seem to be repaid (via *Twint*).

Development of transactions and use case of the application

In October 2018, 1.02 million transactions with a volume of over CHF 65 million were carried out via *Twint*. Across the entire household payment market, with an estimated annual volume of CHF 170 billion, *Twint*'s value-based market share over the past 12 months is estimated at 0.35 percent. If the October figures are extrapolated for the year as a whole, the estimated market share is 0.46 percent. The average amounts of transactions via *Twint* are slightly higher than in the traditional payment market. Therefore, the extrapolated market share in terms of number of transactions is slightly lower at 0.28 percent.

Compared to the same month last year, the number of transactions increased by 134 percent (see Figure 6.30, left-hand chart). Meanwhile, the value-based

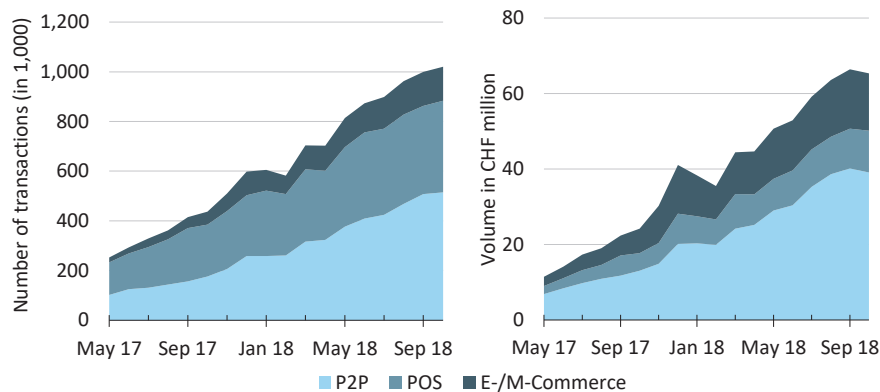


Figure 6.30: Number of transactions and transaction volume by month and use case (Sources: IFZ, Twint)

transaction volume tripled in this period (see Figure 6.30, right-hand chart). It is noteworthy that the Christmas business in December is also noticeable at *Twint*. This effect was felt most strongly in transactions at the point of sale, with an increase in value of 46 percent compared with the previous month.

Data from other providers such as *Apple Pay*, *PayPal*, and *Samsung Pay* are currently not available. According to various, indicative information sources from different market participants, however, it can be assumed that *Twint* has about twice as much volume in Switzerland as *Apple Pay* and *Samsung Pay* combined. *PayPal* claims to have 1 million users in Switzerland. However, they primarily use the service for E-Commerce and M-Commerce, which are still somewhat smaller in terms of the number of transactions, and probably less for P2P. Accordingly, we estimate that currently around 1.75 million transactions per month

are triggered via mobile devices in the narrower sense. In terms of the number of transactions, this corresponds to a market share of around 0.5 percent. These calculations do not take in-app purchases such as the purchase of tickets from the SBB via the mobile device into account.

With regard to the number of mobile payment transactions, the P2P and point of sale use cases dominate at *Twint*. Over the past twelve months, 47 percent of *Twint* transactions were carried out in the P2P area, 39 percent at the point of sale. Only 14 percent of transactions can be allocated to E-Commerce and M-Commerce (see Table 6.3).⁹²

At first glance, it is somewhat surprising that E-Commerce/M-Commerce has so far been relatively insignificant. The corresponding values must, however, be relativised from two perspectives. On the one hand,

| Use Case | Ø Amount in CHF (over 12 months) | Proportion of Twint (over 12 months) | |
|---------------|----------------------------------|--------------------------------------|------------------|
| | | Transaction Proportion | Value Proportion |
| P2P | 77.99 | 47% | 57% |
| POS | 28.35 | 39% | 18% |
| E-/M-Commerce | 117.12 | 14% | 26% |
| Total | 63.87 | 100% | 100% |

Table 6.3: Average transaction amounts and value shares by area of application (Sources: IFZ, Twint)

⁹² E-Commerce also includes User on File (UOF) transactions.

as Table 6.3 shows, the average amounts in the E-Commerce/M-Commerce area, at CHF 117 per transaction, are significantly higher than for other mobile applications (P2P: CHF 78; Point of Sale: CHF 28). On the one hand, the market share of E-Commerce/M-Commerce in relation to the transaction volume is 26 percent, which is significantly higher than the share of number of transactions (14%). On the other hand, the entire E-Commerce/M-Commerce market in Switzerland is currently much smaller than the market at the POS. The *Swiss E-Commerce and Distance Selling Trade Association* estimates the market volume for online and distance selling in 2017 to be CHF 8.6 billion (VSV Versandhandel 2018). With *Twint*, around CHF 151 million has been generated in E-Commerce/M-Commerce over the past 12 months. *Twint's* market share in this segment was thus around 1.76 percent. This is significantly higher than that in the overall payment market. In this respect, the relevance of mobile payment in E-Commerce/M-Commerce is already significantly higher today than at the point of sale. Based on past developments, *Twint* should exceed the two percent market share (in terms of value) mark on the domestic E-Commerce/M-Commerce market by 2018.

6.8.2. Further Developments in Payment Services

The diffusion of smartphones in recent years has created the technological basis for processing debit and credit card payments even without “classic” payment terminals. In combination with a card reader, the so-called mPOS technology makes it possible to convert practically any mobile terminal into a payment terminal.

In the past two years there have been some significant developments in the mPOS market. In May 2018, shortly before the planned IPO, the Swedish company *iZettle*, founded in 2010, was acquired by *Paypal*. It was the largest acquisition in *Paypal's* history. *iZettle* was acquired for USD 2.2 billion. According to *Paypal*, *iZettle* is currently used by half a million merchants (in Scandinavia, Germany, France, Italy, Spain, Mexico and Brazil). *iZettle's* revenues in 2017 were approximately 94 million euros. The largest competitor at present is the US company *Square*, which was founded by *Twitter* boss Jack Dorsey. *Square* went public in 2015 and in November 2018 had a market value of 29 billion dollars – more than ten times that of *iZettle*. The Americans targeted a turnover of one billion dollars in 2018.

Similar offerings exist in Switzerland. *SumUp*, a startup company from Berlin, was the first player active in Switzerland, cooperating with *UBS*. Besides *SumUp*, in the summer of 2016, *Aduno* launched the mobile cashless payment solution *Anypay*, while *SIX* offered *mCashier*. After *SIX Payment Services* purchased the *Aduno Group's* card terminals in August 2017, *mCashier* and *Anypay* were merged. The new mobile card reader is called *mPRIME*. The market in Switzerland is growing. Currently, about 10,000 *UBS* customers are using *SumUp*. There is a growth of around 50,000 transactions per year with *SumUp* customers from *UBS*. Information from other banks is not available.

6.8.3. Outlook

The further development of mobile payment is primarily driven by the behaviour of consumers and retailers. In order to estimate the future development of mobile payment on the customer side, the opinion of (potential) users was determined based on a survey conducted by the *Institute of Financial Services Zug*. Between April and May 2017, more than 300 people took part in an online survey. The respondents answered questions about the market potential of mobile payment on the one hand, and made statements about the acceptance of mobile payment on the other. The survey showed that around 62 percent of this group could imagine paying via their smartphone in the future. It should also be noted that many of the current “non-users” have already used mobile payment in the broader sense. This includes, for example, payment within applications using credit cards. 55 percent of respondents to this group of non-users stated that they had already made in-app purchases on their smartphone (e.g. buying an SBB ticket with the SBB application). Therefore, the market potential appears to be large when one considers the positive attitudes of the survey participants towards mobile payment. In terms of brand awareness, *Twint* has managed to achieve a high level of awareness in a relatively short time period. At 60 percent, the supported brand awareness is higher than that of *Apple Pay* (51%), but lower than that of *PayPal* (84%), which has been active in the market for much longer. In terms of unaided awareness, *Twint* is more well-known than *Apple Pay* or *PayPal*.

Figure 6.31 provides an indication of a possible growth forecast for the mobile payment market. The three blue lines show the number of mobile payment

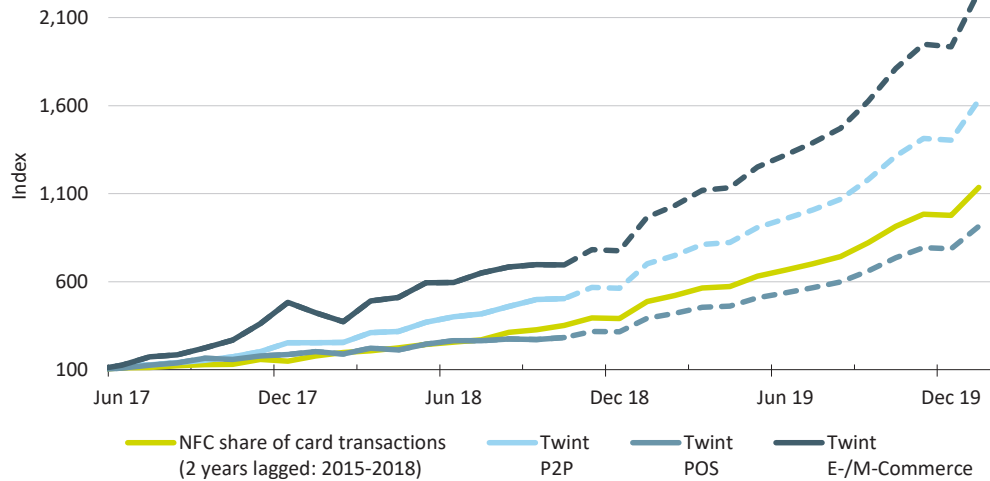


Figure 6.31: Number of mobile payment transactions by *Twint* and proportion of contactless card payments (indexed) (Sources: IFZ, Twint)

transactions by application area (indexed). It also shows how the (indexed) share of NFC card payments has developed in comparison to total debit and credit card payments at the POS (green line), set back by two years. This time lag was chosen because it seems reasonable to assume that the mobile payment market is now where the NFC market was around two years ago. We see that growth of the NFC payment market share accelerated roughly half way through the period of Figure 6.31. In the initial phase, growth was almost linear, but then the curve becomes much steeper. This exponential growth is typical for successful developments in the initial stage. In relative terms, mobile payment at the POS is currently at a similar stage as the NFC payment function was two years ago. In the P2P segment, *Twint* transaction growth was higher, as shown with the light blue line in Figure 6.31. However, the E-Commerce/M-Commerce sector is even more dynamic. Here, even though at a lower level, transactions increased by six fold between May 2017 and October 2018.

If the past development of contactless card payments in comparison to total debit and credit card payments at the POS were extrapolated to the entire mobile payment market (Figure 6.31, dotted lines), an estimated 5.7 million transactions per month would be made via smartphone in 2020. This would corre-

spond to a “market share” of around 1.6 percent in the private payment market.

While some reports in the past have been rather sceptical with reference to mobile payment providers in general and *Twint* in particular, other articles are very optimistic concerning the future development of mobile payment. Overall, it can be said that the glass is half full rather than half empty. The current transaction volume of mobile payment – including *Apple Pay* and *Samsung Pay* – is actually still low with an estimated market share of around 0.5 percent of all transactions. At the same time, the adoption rate of innovation in the payment area is generally very slow in developed countries, especially in the initial phase. The fact that the market development of mobile payment in Switzerland was belittled by some is primarily due to excessive expectations. Now it is important for mobile payment providers to succeed on the one hand by demonstrating to customers and merchants the added value of the existing applications compared with traditional solutions. On the other hand, it would be desirable if the launch of further exciting use cases were promoted (e.g. payment at the parking meter, payment of the pizza courier, or an instant purchase button in E-Commerce). The faster and better the products are developed and the higher the added value for users, the faster the adaptation process will be.

7. Banks and FinTech

Chapter 7 gives an overview of how banks position themselves towards digitalisation, innovation, and FinTech. The first section presents the continuation of the *CIO Barometer* survey which was already conducted in 2015 and 2016. Section 7.2 includes an analysis of the annual reports of Swiss and international banks in order to evaluate the strategic relevance of corresponding topics in the banks' communication.

7.1. CIO Barometer

By Prof. Dr. Thomas Ankenbrand & Nicola Louise Illi, Institute of Financial Services Zug IFZ

The *CIO Barometer*, a survey conducted for the third time, seeks to capture information on the current trends and developments in the Swiss banking market. Individuals in charge of IT operations in Swiss banks were questioned on the challenges they faced and to which extent these are being counteracted on a strategic and operational level.

7.1.1. Methodology

Digitalisation and technological progress pose challenges for today's banks, especially in the field of information technology. Banks are affected by technology on the following fronts (Capgemini & LinkedIn, 2018):

- New business models
- Faster and more efficient service
- Transparency and free services
- Personalisation
- Pressure on margins and fees
- Predictive modelling and advanced data analytics
- Innovative distribution models
- Access to unserved/underserved segments
- Operational efficiency

In order to efficiently structure the different dimensions of a bank's IT department, we applied the *IT Balanced Scorecard* concept by Van Grembergen and Saull (2001), which is based on the original balanced scorecard approach from Kaplan and Norton (1996). Rather than focusing solely on financial targets, the scorecard seeks to develop and monitor a balanced set of non-financial measures too, such as

the regard for customers, processes, or the degree of innovation.

The four dimensions of the IT balanced scorecard applied for this analysis include *User Orientation*, *Business Contribution*, *Operational Excellence*, and *Future Orientation*, which again contain three subtopics each. In general, the dimension *User Orientation* covers the user perception of the IT department, whereas *Business Contribution* aims to measure its value creation. *Operational Excellence* deals with the efficiency and effectiveness of IT processes and *Future Orientation* examines processes and resources required to ensure innovation capabilities. The IT balanced scorecard is suitable to determine and describe strategic directions of a bank's IT department and was thus chosen as the structural framework of the survey.

For the *CIO Barometer* survey, a total of 226 individuals in charge of IT operations in Swiss banks were contacted in October 2018. The final dataset consists of 35 participants, corresponding to a response rate of 15 percent.

7.1.2. Results of the CIO Barometer 2018

The results of the survey are presented in the following sections, starting with the statistical information of the sample, followed by the strategy and priority results from the IT balanced scorecard, the projects and priorities in FinTech, and finally the IT costs.

Statistical information

As illustrated by the left-hand chart in Figure 7.1, cantonal banks, regional & savings banks, Raiffeisen, and private banks were among the participants in the survey. A closer look at the distribution of the balance sheet size as well as the assets under management (AuM), also illustrated in Figure 7.1, shows that these two key figures are below CHF 10 billion for the large majority of the participants.

As the sample size is relatively small and the distribution of the survey participants among the different types of banks, their total balance sheets and assets under management differ from the basis population, the survey cannot be considered representative, though it nevertheless provides indications on the tendencies of Swiss banks' IT strategies and challenges.

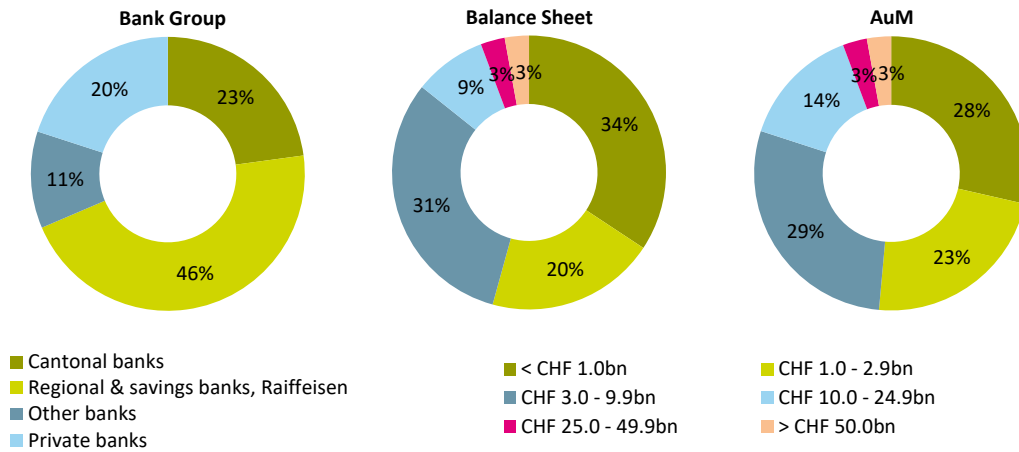


Figure 7.1: Survey participants according to bank group, balance sheet, and assets under management (AuM) (n=35)

IT Balanced Scorecard

The participants were asked to rate the priority of each of the three subtopics from the four dimensions included in the IT balanced scorecard on a scale of four, from very low (1) to very high (4). The results of this evaluation are given in Figure 7.2.

They are in line with the results of the survey conducted in 2015 and 2016⁹³ with the subtopics concerning *Business Contribution* achieving the highest priority on average (3.16), followed by *Operational Excellence* (2.92). *User Orientation* (2.89), and *Future Orientation* (2.39) are still the two lower ranking prior-

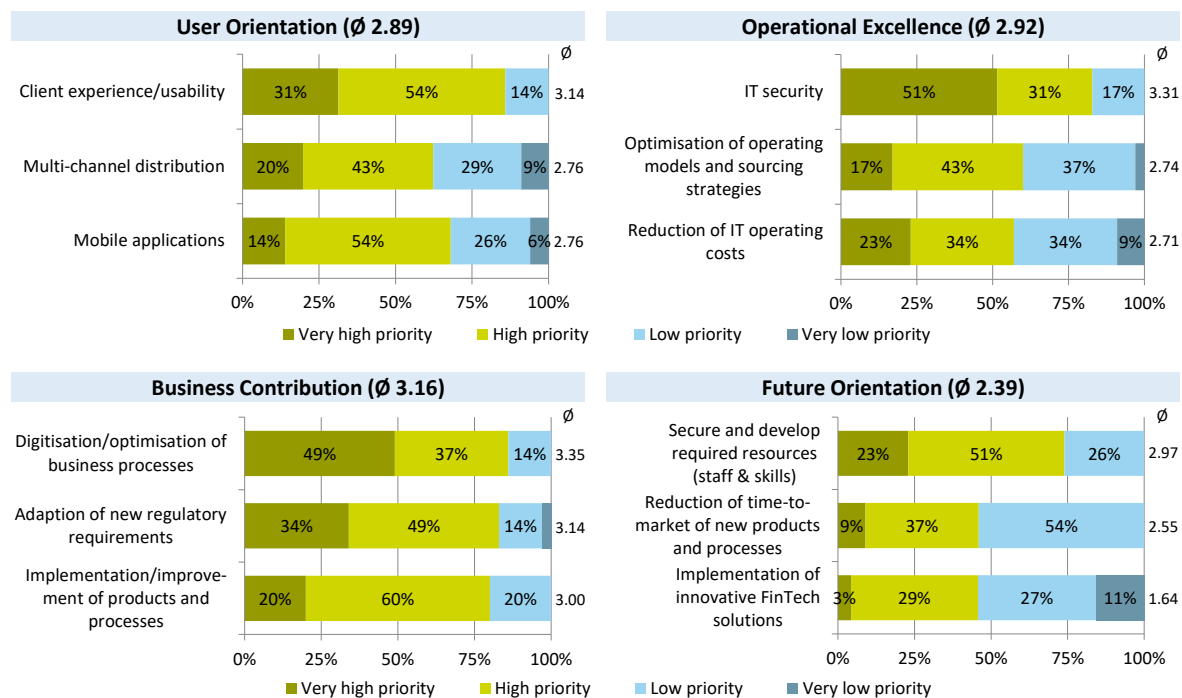


Figure 7.2: Priorities of the IT Balance Scorecard (n=35)

⁹³ The CIO Barometer survey was not conducted in 2017.

ities. This outcome indicates a focus on the short-term rather than long-term orientation of IT strategies of Swiss banks. Across all dimensions, digitisation/optimisation of business processes is given the highest relevance (3.35), followed by IT security (3.31). The lowest relevance is attributed to the reduction of the time-to-market of new products and processes (2.55) and the implementation of innovative FinTech solutions (1.64).

In order to compare today's priorities with the future outlook, the participants were also asked to rate the same subtopics for the next five year period. From a general perspective, all four dimensions of the *IT Balanced Scorecard* are assigned a higher priority in the next five years. When looking at the temporal development, as shown in Figure 7.3, *User Orientation* accounts for the largest increase in priority score and overtakes *Operational Excellence* and *Business Contribution*. Therefore, activities concerning client experience and usability, multi-channel distribution, and mobile applications are expected to be of greater importance in the future. The results from the *Business Contribution* dimension show relatively stable developments of its subtopics compared to the previous surveys. However, the priority of the adaption of new regulatory requirements seems to be expected to level off. In the *Operational Excellence* dimension, although IT security remains a high priority, efforts to reduce IT operating costs are becoming more relevant too. Though the *Future Orientation* dimension generally seems to be a lower priority, it reveals the largest absolute growth between the value achieved in 2015 and the future outlook in the most recent survey. Overall, the results from the survey indicate the priority of an efficient implementation of new products and processes.

FinTech

The second part of the *CIO Barometer* survey examines the bank's projects and priorities in the field of FinTech. In line with our definition of FinTech, the projects and priorities were divided into the FinTech categories described in section 2.1. In a first step, participants were asked if they were currently pursuing, have recently completed or have planned projects in one of the pre-defined categories. The survey revealed that *Banking Infrastructure*, with solutions such as personal finance management tools or online onboarding systems, holds the first place with the highest average number of current or completed pro-

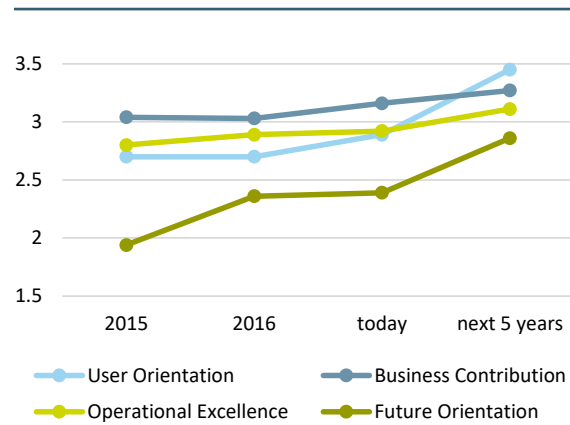


Figure 7.3: Priority averages of the four dimensions over time (n=35)

jects among the participating parties. The categories *Payment*, *Investment Management*, and *Analytics* all hold relatively similar average scores, with a fair amount of current or completed projects, as well as planned projects. Projects in the categories *Deposit & Lending*, as well as *Distributed Ledger Technology* lag behind the rest with only a few projects planned or completed. Overall, the results show a stable development in comparison to the results of the survey conducted in 2016.

In a second step, the participants were asked to rank the FinTech categories according to their priority. The corresponding results are shown in Figure 7.4. A value of "6" indicates the category was given the highest priority, "5" indicates the second highest priority and so forth. The product area *Banking Infrastructure* is given the highest future priority with an average value of 4.16. The *Analytics* area achieves the second highest average (3.99), and thus is evaluated as the second highest priority by the survey participants, followed by *Investment Management* (3.94), *Payment* (3.66), and *Deposit & Lending* (3.00). With an average value of 2.20 *Distributed Ledger Technology* does not seem to be a future priority of Swiss banks. When comparing the stated priorities with the current state of implementation of FinTech solutions, the categories *Analytics* and *Payment* switch positions. Though there are fewer current, completed or planned projects in the field of *Analytics*, it is perceived as a higher priority by the participants. The opposite is true for the *Payment* category.

Costs

In order to judge the effort and expenses related to IT-based innovation in Swiss banks, the participants were asked to state the division of their IT costs into *Run-the-bank* and *Change-the-bank* costs. As expected, none of the participants stated their IT costs as being purely used to either run the bank or change the bank. Figure 7.5 shows the distribution of the responses. 46 percent of the respondents judge the majority of their IT costs being used to run the bank and guarantee the ongoing operation. A further 43 percent assign 60 percent of their IT costs to running the bank and 40 percent to changing the bank, indicating a higher degree of costs allocated for innovation. Eleven percent of the participants state the IT expenditures seeking to change the bank are higher than their IT expenditures for running the bank, showing a fairly high concentration of costs on innovation.

In addition, the participants were asked to state their nominal personnel, and general and administrative expenses, and the percentage thereof that are IT- and non-IT-related. The weighted averages of the figures received are shown in Figure 7.6. The difference between the percentages of IT-related costs within personnel expenses as opposed to general and administrative expenses stands out. While on average only seven percent of personnel expenses are IT-related, IT-related costs account for an average of 61 percent of general and administrative expenses. This indicates that a high percentage of IT positions in

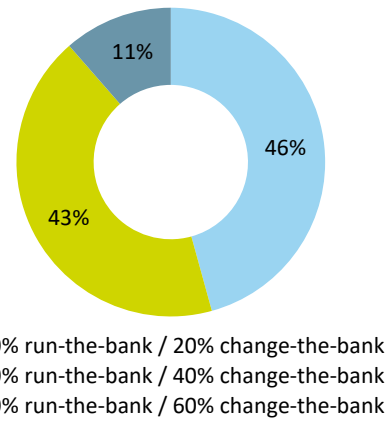


Figure 7.5: Percentage of IT costs which are associated with running the bank or changing the bank (n=35)

Swiss banks may be outsourced and thus reduce the percentage of IT-related costs within the labour costs.

7.1.3. Conclusion

Digitisation/optimisation of business processes and IT security are the main focus of the IT departments at Swiss banks. However, activities concerning the user orientation are gaining in relevance and are expected to assume a leading role at Swiss banks in the future, based on the opinions of the survey participants. Currently, corresponding activities are evaluated with

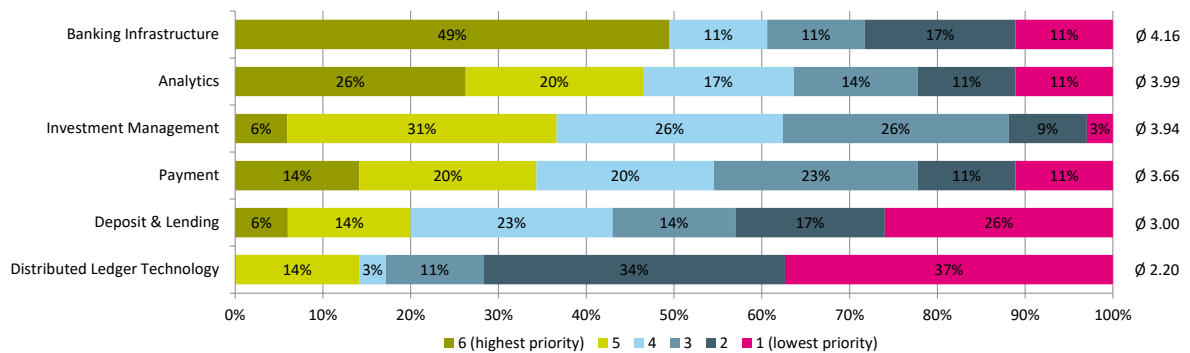


Figure 7.4: Ranking of priority of FinTech categories (n=35)

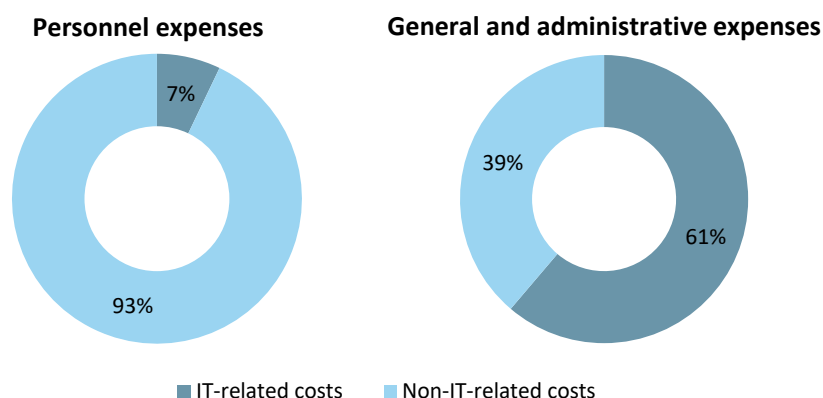


Figure 7.6: Average percentage of IT- and non-IT-related costs (n=18)

similar relevance as the activities concerning the efficiency and effectiveness of IT processes. The primary focus of Swiss banks on evolutionary rather than disruptive transformation is also reflected in the priority ranking of FinTech, where *Banking Infrastructure* achieves the highest and *Distributed Ledger Technology* the lowest score. The allocation of money also reflects the evolutionary development path. Notable is the low percentage of IT-related personnel expenses at seven percent. This reflects the high outsourcing level and the low level of IT competencies remaining with the banks, which could lead to difficulties in adjusting to current and future challenges.

7.2. Analysis of Annual Reports of Banks

By Patrick Hummel, Prof. Dr. Andreas Dietrich,
Prof. Dr. Thomas Ankenbrand & Denis Bieri,
Institute of Financial Services Zug IFZ

For banks, the annual report is one of the most important means of disclosure in corporate communications. This medium not only enables them to justify their past performance to investors, but also to signal the way ahead for the future. Hardly any companies

have been able to resist the megatrend of digitalisation in the recent years. Banks specifically, have had to reorient themselves constantly. The intention of this section is to show how important the topics of digitalisation, innovation and FinTech really were for the various banking categories and how these topics have been addressed in annual reports over the past ten years. For this study, we have therefore analysed 959 annual reports from 90 banks in terms of terminology.⁹⁴ The results are surprising with regards to the “most digital banking class”.

Banks’ annual reports are extensive. For regulatory reasons, certain content and structures are specified for the banks. For example, banks must include a balance sheet and income statement in their report and comment on them. In addition, the annual reports must contain information on corporate governance, as well as information on provisions for certain risks. The scope of the information on these topics is strongly linked to the size and complexity of the banks or banking categories. Large banks, for instance, include very comprehensive risk records in their annual report, some of which are over 100 pages long, whereas regional banks can document their risks within just a few pages. In addition to the man-

⁹⁴ A first version of the analysis was published on the IFZ Retail Banking Blog on October 30, 2018. This analysis includes, in addition, the annual reports of ten international banks

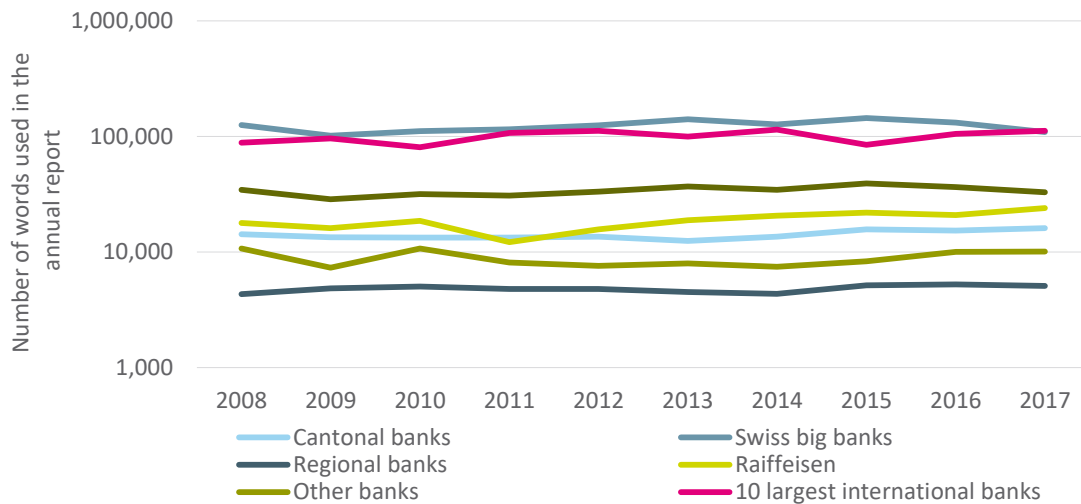


Figure 7.7: Development of the total number of words used in the annual reports

datory part, banks can determine part of the content themselves. Thus, certain banks also choose to shed light on their forthcoming developments and goals for the future. Figure 7.7 shows, however, that banks have defined and found a typical length and structure of their annual reports. Measured by the number of words, the annual reports from the various categories of banks demonstrate a consistently similar length over the last ten years.

How important are strategically relevant topics such as digitalisation, innovation, and FinTech in the communication by banks? Have there been any changes to the degree of communication of these topics over the past ten years, i.e. are banks now addressing digitalisation more intensively than in the past? Through text analysis of annual reports, we were able to identify the trends, as well as find out which directions the banks were advancing digitalisation in, or in other words, which topics were most important for the banks in which years.

7.2.1. Methodology

The analysis includes a total of 959 annual reports from 80 Swiss banks and from the ten largest international banks as measured by total assets⁹⁵ in the period from 2008 to 2017. The annual reports of the Swiss banks include those from 18 cantonal banks, 52 regional banks, two big banks, seven other banks, and Raiffeisen. For the analysis, the annual reports were first converted into pure text files, then adjusted and standardised. The special characters and the numeric characters were eliminated. Then, the pure texts were broken down into word units. The absolute frequency of the words used in each annual report could be calculated based on the word units. Subsequently, a relevant selection of terms linked to digitalisation, innovation, and FinTech was made based on the FinTech categories and their subcategories in section 2.1. The most important terms for the study were defined using various synonyms, word stems and translations.⁹⁶

⁹⁵ They include *Industrial and Commercial Bank of China, China Construction Bank Corporation, Agricultural Bank of China, Bank of China, Mitsubishi UFJ Financial Group, JPMorgan Chase & Co., HSBC Holdings PLC, BNP Paribas, Bank of America, and Crédit Agricole.*

⁹⁶ The list of all keywords included in this analysis can be found in Appendix C.

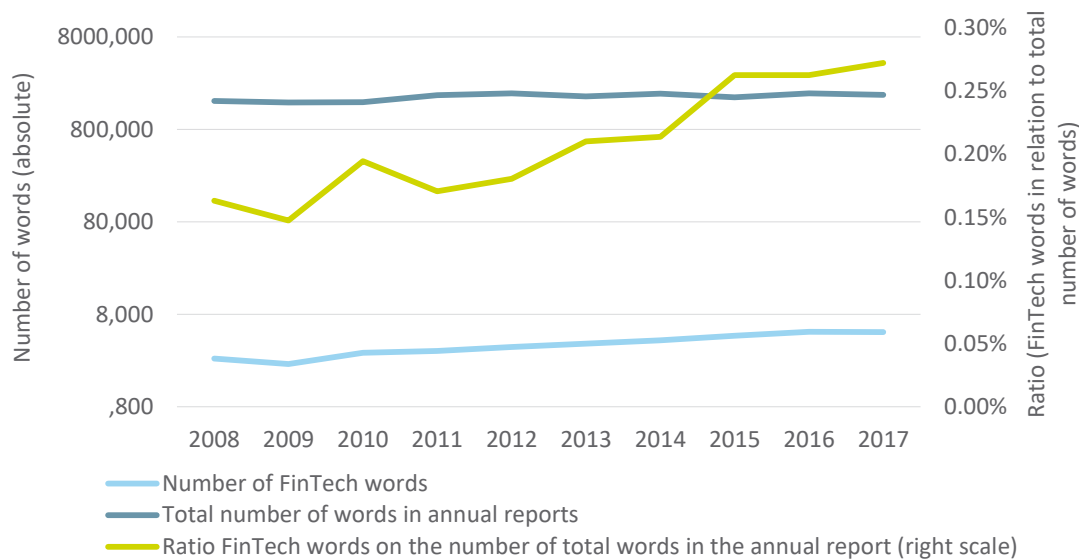


Figure 7.8: FinTech words used in the annual reports of the 90 banks analysed

For the evaluations, we compared the absolute frequencies of the defined words on an aggregated level with the total sum of all words used in the annual reports. This way, we were able to determine the importance of the topics digitalisation, innovation, and FinTech in the annual reports and also show how the trend developed over the years. At the same time, it should of course be noted that the text analyses only covers how relevant these topics actually are in the strategic implementation of the various banks.

7.2.2. Development of the Use of FinTech-related Words

The volume (number of words) of the banks' annual reports has developed constantly over the last ten years, as was already shown for all bank groups. Figure 7.8 shows that the frequency of FinTech-related words has increased in the same period. In 2008, the 90 banks used 2,649 words in their annual reports, which related to the topics of digitalisation, innovation, and FinTech. On average, two FinTech words appeared in a text of 1,250 words (which corresponds to the length of this subchapter 7.2). Expressed as a ratio, this represents 0.16 percent of the total number of words. This ratio has increased over the past years. In 2017, the number of FinTech-related words mentioned

was 1.7 times higher than in 2008, resulting in a ratio of 0.27 percent of the total number of words.

However, the increasing importance of FinTech-related words in annual reports varies greatly, as shown in Figure 7.9. The Swiss big banks, for example, generally disclose relatively less information on the topic of digitalisation, innovation, and FinTech in their annual reports. Moreover, the amount of information disclosed has not increased since 2008, while an increase can be observed in all other banking categories. The relatively large difference between the Swiss big banks and the international big banks in this respect is also remarkable. The occurrence of words on digitalisation, innovation, and FinTech in the annual reports of international banks is practically three times as large. Accordingly, international banks communicate significantly more about this megatrend than Swiss big banks do. In Switzerland, Raiffeisen is the frontrunner in communication of digitalisation, with every 185th word dealing with this topic in the 2017's report. Like the big banks, the regional banks are also comparably cautious when it comes to reporting on digitalisation, innovation, and FinTech. Relative to 2008, however, they report the highest growth rate of corresponding words compared to all other banking groups.

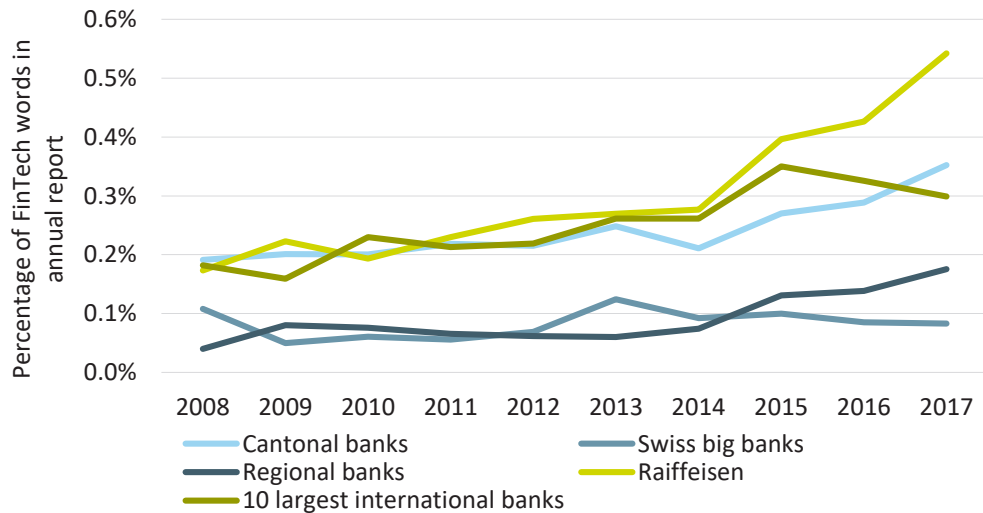


Figure 7.9: FinTech words used in relation to total words by bank group

The keywords most commonly used in annual reports are more general terms such as “digitalisation”, “innovation”, and “web”. Furthermore, terms such as “e-banking”, “mobile” or “transformation” are used relatively frequently. The term “Twint” has been the ninth most used innovation-related term among Swiss banks over the past four years.

7.2.3. Conclusion

With the help of text analysis, an indication is obtained of how relevant terms relating to the topics of digitalisation, innovation, and FinTech are in the context of communication through annual reports and how the frequency of these terms has developed over time. From the analysis presented, we can draw the following conclusion:

- The length of annual reports and the number of words used per annual report have remained virtually unchanged over the past ten years.
- The communication about digitalisation, innovation, and FinTech has become more relevant at Raiffeisen and the cantonal banks and to a lesser extent at regional banks over the last few years. To some extent, quite large differences between individual banks with regard to the frequency of use of these terms in the annual report can be identified. Compared to the international big banks, Swiss big banks tend to report less about digitalisation, innovation, and FinTech.

8. Conclusion & Outlook

The IFZ FinTech study aims to give an annual overview of the state and the developments in the Swiss FinTech ecosystem. Based on the findings of this year's edition, we conclude with the following five statements:

FinTech is important for Switzerland. The Swiss FinTech sector grew significantly in 2018. By the end of the year, a total of 356 FinTech companies were active in Switzerland, implying a year-to-year growth rate of 62 percent. The sector has not only grown but also continued to mature, as underlined by the average number of FTEs employed at Swiss FinTech companies, as well as their capitalisations. This trend towards a higher maturity of the sector was already observed in the past editions of the study. Although the absolute figures are still low, the FinTech sector is undertaking a contrasting development compared to the general financial industry, where the number of institutions and employees tend to decline. The general conditions for the FinTech sector are good in Switzerland, which is reflected in a strong second and third position of the Swiss cities included in our hub ranking.

Fin is local and Tech is global. One of the main findings of the last year's edition of the IFZ FinTech study was that global innovation is the key driver for Swiss FinTech companies to succeed in the long run. This year's results show that this applies in particular for FinTech companies in the technology-driven product areas like *Distributed Ledger Technology* and *Analytics*. FinTech companies with a clear focus on providing innovative solutions for traditional financial processes, products or services, e.g. solutions in the fields of *Deposit & Lending* and *Payment*, reveal a comparably higher local or regional orientation. FinTech companies in technology-driven product areas such as *Distributed Ledger Technology* and *Analytics* reveal a higher international orientation than *Deposit & Lending* or the *Payment*. This holds for the Swiss FinTech companies, but also for those abroad.

Innovation should solve real problems. The main objective of technological innovation in the financial industry should be to achieve higher business volumes, higher margins, lower costs and/or lower risks

for businesses, as well as improved usability and lower costs for users. However, some of the current innovations in the financial industry do not meet these goals, but rather represent trendy solutions with only limited added value. The consistent implementation of a solid business model with clear added value for the customer would be more important than the simple use of exotic technologies. Not in the least because there are still certain gaps in the application of new technologies, which offers further research opportunities. The financial industry needs technologies that are both reliable and interpretable.

From hype to reality through disillusionment. Another finding in last year's edition of the IFZ FinTech study was that the Swiss FinTech sector moved from a hype to reality. This was confirmed in 2018 by the continued maturation of Swiss FinTech companies, as well as the larger venture capital transactions in the sector. On the other side, the market for cryptographic assets was subject to a significant correction. Overall, our findings show that the developments in the FinTech sector are very diverse and at different stages depending on the business segment and the individual company.

Traditional banks have to evolve or will end up becoming irrelevant. The declining value added by the Swiss financial industry to the total income of the Swiss economy is a consequence of the steadily decreasing relevance of traditional financial institutions. Reasons for this development include new business models, that make some services provided by banks obsolete. Examples hereof are *UBER* or *AirBnB*, whose solutions seamlessly integrate the payment process without the involvement of traditional banks. Another example is robo-advisors, some of which are also offered by traditional banks, who generate lower revenues than traditional offerings. The declining relevance of banks is, however, not of a disruptive nature. FinTech companies or tech companies are in many cases simply faster and more efficient in the implementation and application of new technologies. Of course, traditional banks could also be winners of the digital transformation if they possess the right skills and corporate culture to implement technological innovations quickly and consistently.

9. Factsheets of Swiss FinTech Companies

This final chapter contains the factsheets of all the Swiss FinTech companies that participated in our survey. The factsheets are based on the Business Model Canvas from Osterwalder and Pigneur (2010), described in section 2.3. They were created with the help of publicly accessible sources such as a company's website, the commercial register and further information platforms. These draft versions were then passed on to the respective companies for the purpose of verification, correction and completion. The information received from the companies was not verified again. Note that only the companies that returned the factsheets appear in the following pages. However, all the companies that received a factsheet were included in the database. At this point, we would like to take the opportunity to thank all the companies that took part in the survey.

Companies

| | | | |
|-----------------------------------|-----|---------------------------------|-----|
| 3circlefunding GmbH | 92 | Crowd4Cash – Crowd Solutions AG | 111 |
| 3rd eyes AG | 92 | Crowdhouse AG | 111 |
| AAAccell AG | 93 | Crowdpark SA | 112 |
| ABC Platform – Diamond Digital AG | 93 | Crypto Finance AG | 112 |
| Acredius AG | 94 | Cryptoprofiler – Riskifier | 113 |
| ADDFIN AG | 94 | Custodigit AG | 113 |
| AdNovum Informatik AG | 95 | daura AG | 114 |
| Advanon AG | 95 | Decentriq AG | 114 |
| Adviscent AG | 96 | Descartes Finance AG | 115 |
| AlgoTrader AG | 96 | Dufour Capital AG | 115 |
| AMNIS Treasury Services AG | 97 | Ecofin Holding AG | 116 |
| Apiax AG | 97 | eCollect AG | 116 |
| ARCATrust SA | 98 | Element36 AG | 117 |
| Assetmax AG | 98 | Elvia e-invest AG | 117 |
| atfinity GmbH | 99 | EM Exchange Market GmbH | 118 |
| Axle – B&B Analytics AG | 99 | Enterprise Bot GmbH | 118 |
| Beedoo SA | 100 | ERI Bancaire SA | 119 |
| Billte AG | 100 | Etops AG | 119 |
| Bitcoin Suisse AG | 101 | Evolute AG | 120 |
| BlockState AG | 101 | FinForm AG | 120 |
| Bloomio AG | 102 | finnova AG | 121 |
| bob Finance AG | 102 | Flink AI AG | 121 |
| Byjuno AG | 103 | Forctis AG | 122 |
| Canopy Europe AG | 103 | Foxstone SA | 122 |
| Capnovum (Switzerland) GmbH | 104 | Futuræ Technologies AG | 123 |
| Cashare AG | 104 | getBUTIK – Dublin IT GmbH | 123 |
| CashSentinel SA | 105 | greenmatch AG | 124 |
| CB Financial Services AG | 105 | GWAP Financial Sarl | 124 |
| c-crowd AG | 106 | Hyposcout AG | 125 |
| Clear Minds Investment AG | 106 | IBANI SA | 125 |
| Confinale AG | 107 | IMburse AG | 126 |
| Contovista AG | 107 | ImmoYou AG | 126 |
| CoreLedger Labs GmbH | 108 | InCube Group AG | 127 |
| Crealogix AG | 108 | Instimatch Global AG | 127 |
| Credit Exchange AG | 109 | Integration Alpha GmbH | 128 |
| Creditfolio AG | 109 | Invemo GmbH | 128 |
| CreditGate24 (Schweiz) AG | 110 | Inventx AG | 129 |
| creditworld AG | 110 | InvestGlass SA | 129 |

Companies

| | | | |
|---|-----|------------------------------------|-----|
| Investiere.ch – Verve Capital Partners AG | 130 | SIX Group AG | 149 |
| Investment Navigator AG | 130 | Smart Valor AG | 149 |
| INVESTORY AG | 131 | SmartMoneyMatch – 4Finance AG | 150 |
| iquant GmbH | 131 | Spitch AG | 150 |
| KOINA AG | 132 | Splendit AG | 151 |
| Ledgy AG | 132 | Squirro – Nektoon AG | 151 |
| lend.ch – Switzerland AG | 133 | Status Research & Development GmbH | 152 |
| Lendico Schweiz AG | 133 | Stiftung DECENT | 152 |
| Lendity AG | 134 | Swiss Crypto Tokens AG | 153 |
| Lendora SA | 134 | Swiss Crypto Vault AG | 153 |
| Loanbox – Swiss FinTech AG | 135 | Swiss Fin Lab GmbH | 154 |
| LumRisk SA | 135 | Swissborg SA | 154 |
| meetinvest AG | 136 | Swisscom Blockchain AG | 155 |
| Metaco SA | 136 | SwissLending SA | 155 |
| Monetha GmbH | 137 | Swissquote Group Holding SA | 156 |
| MoneyPark AG | 137 | Sygnum AG | 156 |
| Mt Pelerin Group SA | 138 | Systemcredit AG | 157 |
| neon Switzerland AG | 138 | Systemorph AG | 157 |
| NetGuardians SA | 139 | Taurus Group AG | 158 |
| Oakura Venturas AG | 139 | TaxLevel AG | 158 |
| onedot AG | 140 | Tensor Technologies AG | 159 |
| Parashift AG | 140 | theScreener Investor Services AG | 159 |
| PassOn AG | 141 | Tilbago AG | 160 |
| Payment 21.com – Moving Media GmbH | 141 | TimeStatement AG | 160 |
| Pexapark AG | 142 | Tindeco Financial Services AG | 161 |
| Polixis Sarl | 142 | TokenGate.io – DSENT AG | 161 |
| Private Alpha Switzerland AG | 143 | TokenSuisse AG | 162 |
| qashqade AG | 143 | Tradeplus24 AG | 162 |
| Quotip – DmanD GmbH | 144 | True Wealth AG | 163 |
| Raizers SA | 144 | Trustwise.io AG | 163 |
| RigoBlock – Rigo Investment Sagl | 145 | Utluna Solutions SA | 164 |
| ROCKZ AG | 145 | visionand AG | 164 |
| Run my Accounts AG | 146 | WealthArc GmbH | 165 |
| Seba Crypto AG | 146 | WeCan.Fund SA | 165 |
| SecurionPay – Online Payments Group AG | 147 | Yova AG | 166 |
| SharesInside AG | 147 | | |
| Signatys Sarl | 148 | | |
| Simplewealth AG | 148 | | |

**3circlefunding GmbH**

Founded in 2015
Location Zurich

www.3circlefunding.ch

Category Deposit & Lending
Valuation

Multi-product Crowdfunding platform - With the aim of giving both borrowers and lenders more freedom and control over their loans, 3circlefunding allows borrowers to set loan interest rates and investors to sell loan parts in its secondary market.

| Board Members | | Management Team | |
|--|---------------------|------------------|--------------------------------------|
| Anthony McCarthy | | Anthony McCarthy | |
| Key Partners | Key Resources | | Key Activities |
| Bisnode, Creditreform & CRIF (Credit check agencies) | Employees in 2018 | 4 | Programming & Engineering |
| | ...of which in CH | 4 | Marketing / Finding Clients |
| | Total Funding (CHF) | 1,425,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**3rd eyes AG**

Founded in 2015
Location Zurich

www.3rd-eyes.com

Category Investment Management
Valuation

3rd-eyes improves and automates wealth planning and investment advice. Our system provides a holistic assessment of the clients' wealth, optimises their asset allocation using Monte-Carlo simulation and recommends a set of financial products for execution.

| Board Members | | Management Team | |
|--|---------------------|---|--------------------------------------|
| Cécile Biccari-Churet, Stephanie Feigt, Rodrigo Amandi, Marc Mettler | | Stephanie Feigt, Rodrigo Amandi, Michael Koschinsky, Marc Mettler | |
| Key Partners | Key Resources | | Key Activities |
| Niiio, Fundinfo, Protinus, etc. | Employees in 2018 | 12 | Programming & Engineering |
| | ...of which in CH | 6 | Marketing / Finding Clients |
| | Total Funding (CHF) | 2,500,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**AAAccell AG**

Founded in 2012
Location Zurich

www.aaacell.ch

Category Investment Management
Valuation CHF 15,000,000

We are at the forefront of setting standards in the areas of asset- and risk management (portfolio optimisation/robo-advisory/active risk monitoring). We are a spin-off company of the University of Zurich.

| Board Members | | Management Team | |
|--|---------------------|---|--------------------------------------|
| Sandro Schmid, Boris Wälchli, Pawel Polak, Marc Paoella, Walter Farkas, Karl Schmedders | | Sandro Schmid, Boris Wälchli, Pawel Polak, Marc Paoella, Walter Farkas, Karl Schmedders | |
| Key Partners | Key Resources | | Key Activities |
| BhFS, YUKKA Lab, RISE, Swiss Risk Association, Accelompent, Frankfurt School of Finance Management, SBCN (Korea) | Employees in 2018 | 12 | Programming & Engineering |
| | ...of which in CH | 11 | Marketing / Finding Clients |
| | Total Funding (CHF) | 100,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**ABC Platform - Diamond Digital AG**

Founded in 2017
Location Schwyz

www.abcplatform.com

Category Distributed Ledger Technology
Valuation

Founder of ABC platform, which creates liquidity for hard to trade materials thereby closing the trade-financing gap in the commodity industry.

| Board Members | | Management Team | |
|--|---------------------|-----------------|--------------------------------------|
| Mathias Bucher, Thomas Dübendorfer, Gabriela Lippe-Holst | | Mathias Bucher | |
| Key Partners | Key Resources | | Key Activities |
| Swiss Diamond Coin Foundation | Employees in 2018 | | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Acredius AG**

Founded in 2017
Location Zurich

www.acredius.ch

Category Deposit & Lending
Valuation

Acredius is a Swiss independent crowdlending platform. Private and institutional investors can diversify their portfolios starting from a CHF 200 investment. SMEs and startups get access to fair loans using their traditional and non-traditional data.

| Board Members | | Management Team | |
|---|---------------------|----------------------|--------------------------------------|
| Nada Chebli, Thomas Hentz, Ghassen BenHadjSalah | | Ghassen BenHadjSalah | |
| Key Partners | Key Resources | | Key Activities |
| TMF Group, CRIF | Employees in 2018 | 4 | Programming & Engineering |
| | ...of which in CH | 3 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| SaaS | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**ADDFIN AG**

Founded in 2014
Location Zug

www.addfin.com

Category Investment Management
Valuation

ADDFIN is the one-stop-solution provider of choice for independent asset managers in the area of digitalization, standardization and automatization of all tasks related to wealth management.

| Board Members | | Management Team | |
|--|---------------------|---|--------------------------------------|
| Peter J. Hegglin, Christian Bodmer, Jürg Koller | | Peter J. Hegglin, Fares Abdullah, Serge Garazi, Reto Niedermann, Jan Diethelm | |
| Key Partners | Key Resources | | Key Activities |
| BDO, SIX Financial Services, Fundinfo, Investment Navigator, BRP/ Indigita, IR&M, Künzi/MacNab, Research Pool, Sentifi | Employees in 2018 | 6 | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | 500,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| SaaS | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**AdNovum Informatik AG**

Founded in 1988
Location Zurich

www.adnovum.ch

Category Banking Infrastructure
Valuation

AdNovum Informatik AG engages in the development, implementation, and integration of customized business applications and security software.

| Board Members | | Management Team | |
|--|---------------------|--|--------------------------------------|
| Adrian Bult, Adrian Koch, Daniel Wälchli | | Chris Tanner, Kornel Wassmer, Tom Sprenger, Stephan Schweizer, Peter Gassmann, Roger Bösch, Daniel Gahlinger | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 600 | Programming & Engineering |
| | ...of which in CH | 370 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Advanon AG**

Founded in 2015
Location Zurich

www.advanon.com

Category Deposit & Lending
Valuation

Online platform that allows SME's to sell their open invoices directly to investors. By that they have access to liquidity and investors on the other hand can invest in a new type of asset class.

| Board Members | | Management Team | |
|--|---------------------|--|--------------------------------------|
| Daniel Gutenberg, Stijn Pieper | | Phil Lojacono, Stijn Pieper, Andrea Pünchera, Markus Gehrman | |
| Key Partners | Key Resources | | Key Activities |
| Deutsche Bank, AXA, bexio, BLKB, Swisscom, ETH Entrepreneur Club | Employees in 2018 | 35 | Programming & Engineering |
| | ...of which in CH | 35 | Marketing / Finding Clients |
| | Total Funding (CHF) | >7,000,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



Adviscent
Interactive Advisory

Adviscent AG
Founded in 2010
Location Zurich

www.adviscent.com
Category Investment Management
Valuation

Interactive Advisor –Personalized investment and sales content for Wealth Management clients, prospects and client advisors. For a more efficient and effective advisory process.

| Board Members | | Management Team | |
|--------------------------------|---------------------|--------------------------------|--------------------------------------|
| Thomas Bosshard, Stephan Jöhri | | Thomas Bosshard, Stephan Jöhri | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 30 | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



AlgoTrader AG
Founded in 2014
Location Zurich

www.algotrader.com
Category Investment Management
Valuation CHF 25,000,000

Algorithmic trading software for trading companies such as hedge funds, proprietary trading and crypto currency trading firms.

| Board Members | | Management Team | |
|---|---------------------|--|--------------------------------------|
| Christian Janson, Martin Trepp, Luzius Meisser, Simon Moolman, Andy Flury | | Andy Flury, Richard Chmiel, Roger Langen | |
| Key Partners | Key Resources | | Key Activities |
| Swisscom/CustoDigit, Espertech Inc. | Employees in 2018 | 25 | Programming & Engineering |
| | ...of which in CH | 12 | Marketing / Finding Clients |
| | Total Funding (CHF) | 1,500,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**AMNIS Treasury Services AG**

Founded in 2014
Location Zurich

www.amnistreasury.ch

Category Payment
Valuation

Our fully automated electronic platform simplifies the handling of currency exchange and international payments for SME.

| Board Members | | Management Team | |
|---|---------------------|---|--------------------------------------|
| Robert Bloch, Michael Wuest, Philippe Christen | | Robert Bloch, Michael Wuest, Philippe Christen, Daniel Toggenburger | |
| Key Partners | Key Resources | | Key Activities |
| VQF, Swiss Mechanic, swiss made software, Swiss Finance Startups, Banks (white labelling) | Employees in 2018 | 6 | Programming & Engineering |
| | ...of which in CH | 6 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Apiax AG**

Founded in 2017
Location Zurich

www.apiax.com

Category Banking Infrastructure
Valuation

Apiax offers the most powerful tools to master complex financial regulations digitally.

| Board Members | | Management Team | |
|--|---------------------|--|--------------------------------------|
| Sonja Stirnimann, Jürg Christian Steiger, Ralph Marco Mogenicato, Nicolas Blanchard, Philip Schoch | | Philip Schoch, Nicolas Blanchard, Ralf Huber, Thomas Suter | |
| Key Partners | Key Resources | | Key Activities |
| Swisscom, EY, PwC, BDO, Temenos | Employees in 2018 | 16 | Programming & Engineering |
| | ...of which in CH | 9 | Marketing / Finding Clients |
| | Total Funding (CHF) | 1,500,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**ARCATrust SA**

Founded in 2018
Location Vaud

www.arcatrust.io

Category Distributed Ledger Technology
Valuation

ARCATrust is a cybersecurity company building secure execution environments for highly sensitive data processing and storage. Its general purpose security platform is used in a wide range of vertical markets, one of them being banking and fintech sectors exploiting Blockchain applications as a new asset class.

| Board Members | | Management Team | |
|--|---------------------|---|--------------------------------------|
| Patrick Trinkler, Khaled Ouafi, Yacine Felk | | Patrick Trinkler, Khaled Ouafi, Yacine Felk | |
| Key Partners | Key Resources | | Key Activities |
| Swisscom Blockchain, TEMENOS, DLT Law, EPFL, Venture Leaders | Employees in 2018 | 10 | Programming & Engineering |
| | ...of which in CH | 10 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Assetmax AG**

Founded in 2013
Location Zurich

www.assetmax.ch

Category Banking Infrastructure
Valuation

Assetmax offers compliance & regulation, portfolio management, front office, fees & profitability and backoffice outsourcing services in one integrated platform for Independent Asset Managers and banks.

| Board Members | | Management Team | |
|--|---------------------|--|--------------------------------------|
| Markus Oswald, Eric Gisiger, Massimo Ferrari, Christophe Audergon, Sven Müller | | Massimo Ferrari, Sven Müller, Manuela Vielmi, Jacopo Malnati, Yuval Sharon | |
| Key Partners | Key Resources | | Key Activities |
| Synpulse, Geissbühler Weber & Partner, SIX, Tinext | Employees in 2018 | 25 | Programming & Engineering |
| | ...of which in CH | 25 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**atfinity GmbH**

Founded in 2016
Location Zurich

www.atfinity.ch

Category Banking infrastructure
Valuation

Our mission is to simplify compliance, reduce compliance risks and enable business. We help banks to stay ahead in compliance.

| Board Members | | Management Team | |
|---|---------------------|----------------------------------|--------------------------------------|
| Alexander Balzer, Daniel Büchler, Thorben Croisé, Ingo Drexler | | Alexander Balzer, Thorben Croisé | |
| Key Partners | Key Resources | | Key Activities |
| Business Consultants, Implementation Consultants, Legal Content Providers | Employees in 2018 | 14 | Programming & Engineering |
| | ...of which in CH | 14 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Axle - B&B Analytics AG**

Founded in 2014
Location Zug

www.bbanalytics.biz

Category Investment Management
Valuation

B&B Analytics (BBA) is a strategic advisor for performance and risk management of total wealth.

| Board Members | | Management Team | |
|---|---------------------|---|--------------------------------------|
| Guido Buehler, Andreas-Walter Mattig, Philipp Baretta, Sébastien Mérillat | | Guido Buehler, Philipp Baretta, Rohan Misra | |
| Key Partners | Key Resources | | Key Activities |
| Tend, Investglass, WealthMosaic, Statpro, Expersoft, Softdotcom | Employees in 2018 | 15 | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | 6,000,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Beedoo SA**

Founded in 2014
Location Vaud

www.beedoo.ch

Category Deposit & Lending
Valuation

A Swiss based fund raising platform for Entrepreneurs and Investors looking for more than just finance.

| Board Members | | Management Team | |
|---------------------------|---------------------|-----------------|--------------------------------------|
| Maria Del Carmen Croisier | | David Croisier | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Billte AG**

Founded in 2017
Location Zurich

www.billte.ch

Category Payment
Valuation CHF 5,000,000

We are a multichannel for sending invoices (email, Whatsapp, SMS, eBill) and payments (Credit Cards, online banking, instalments). Billte serves as a bridge between companies and consumer for bill payments.

| Board Members | | Management Team | |
|---|---------------------|--|--------------------------------------|
| Dennis Claude Flad, Sabina Lindevall, Srdjan Micic, Raphael Bianchi | | Andrea Girasole, Srdjan Micic, Jakeer Mohammad, Sabina Lindevall | |
| Key Partners | Key Resources | | Key Activities |
| Banca Stato (Cantonal Bank of Ticino), Generali Switzerland | Employees in 2018 | 10 | Programming & Engineering |
| | ...of which in CH | 4 | Marketing / Finding Clients |
| | Total Funding (CHF) | 450,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Bitcoin Suisse AG**

Founded in 2013
Location Zug

www.bitcoinsuisse.ch

Category Distributed Ledger Technology
Valuation

Bitcoin Suisse AG is a Swiss-based financial service provider specializing in crypto-assets.

| Board Members | | Management Team | |
|--|---------------------|---|--------------------------------------|
| Niklas Nikolajsen, Arthur Vayloyan, Urs Bigger, Luzius Meisser | | Arthur Vayloyan, Niklas Nikolajsen, Stefan Lütolf, Andrej Majcen, Lothar Cerjak, Fabian Hediger, Christian Holm, Lars Hodel, Rolf Gätzi, David Riegelning | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 75 | Programming & Engineering |
| | ...of which in CH | 54 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**BlockState AG**

Founded in 2018
Location Zug

www.blockstate.com

Category Banking Infrastructure
Valuation

BlockState is providing modular infrastructure for financial institutions to reduce operational costs and streamline processes. We are building a powerful toolbox for banks, asset managers and financial specialists to facilitate the structuring, issuance and lifecycle management of financial products. By digitizing the financial product we reduce costs and create additional revenue potential for the underwriter and issuer.

| Board Members | | Management Team | |
|--|---------------------|--|--------------------------------------|
| Michael Weber, Martin Hobler, Paul Claudius, Patrick Storchenegger | | Paul Claudius, Michael Weber, Samuel Brack, Carl Bruns | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 10 | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | > 1,000,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Bloomio AG**

Founded in 2017
Location Zug

www.bloomio.com

Category Distributed Ledger Technology
Valuation

Blockchain-based crowdfunding platform connecting individual investors and startups.

| Board Members | | Management Team | |
|--|---------------------|--|--------------------------------------|
| Emile Osumba, Mark Shmulevich, Maxim Lyadvinskiy | | Maxim Lyadvinskiy, Emile Osumba, Alexey Raevsky, Francesco De Santis | |
| Key Partners | Key Resources | | Key Activities |
| Working in progress | Employees in 2018 | 12 | Programming & Engineering |
| | ...of which in CH | 2 | Marketing / Finding Clients |
| | Total Funding (CHF) | 1,400,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**bob Finance AG**

Founded in 2015
Location Zurich

www.bobfinance.ch

Category Deposit & Lending
Valuation

bob Finance is a Zurich-based FinTech company that provides innovative, digital, retail oriented financial products to the Swiss consumer.

| Board Members | | Management Team | |
|--|---------------------|---|--------------------------------------|
| Adriano Margiotta, Tobias Arnold Knechtle, Paul Michael Müller | | Hilmar Scheel, Tim Ackermann, Wolfgang Gröschel | |
| Key Partners | Key Resources | | Key Activities |
| Glärner Kantonalbank | Employees in 2018 | 20 | Programming & Engineering |
| | ...of which in CH | 20 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Byjuno AG**

Founded in 2015
Location Zug

www.byjuno.ch

Category Payment
Valuation

Byjuno is a FinTech Start-Up within the payment & consumer finance industry for alternative payments.

| Board Members | | Management Team | |
|---|---------------------|---|--------------------------------------|
| Mikael Ericson, Christian Stolz, Johan Brodin, Per Christofferson | | Christian Stolz, Mike Strahm, Michele Pintori | |
| Key Partners | Key Resources | | Key Activities |
| SBB, Datatrans | Employees in 2018 | 45 | Programming & Engineering |
| | ...of which in CH | 20 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Canopy Europe AG**

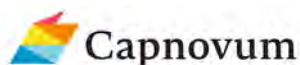
Founded in 2019
Location Zug

www.canopy.cloud

Category Analytics
Valuation CHF 30,000,000

Canopy, is an anonymous financial data aggregation and insights platform for high net-worth individuals.

| Board Members | | Management Team | |
|--------------------------------|---------------------|--|--------------------------------------|
| Tanmai Sharma, Martin Pickrodt | | Tanmai Sharma, Amit Gupta, Michiel van Selm, Greg Rigby, Sinan Biren | |
| Key Partners | Key Resources | | Key Activities |
| Bloomberg, FactSet, Tableau | Employees in 2018 | 46 | Programming & Engineering |
| | ...of which in CH | 1 | Marketing / Finding Clients |
| | Total Funding (CHF) | 14,300,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |


Capnovum (Switzerland) GmbH
www.capnovum.com
Founded in 2016

Category Banking Infrastructure

Location Zurich

Valuation

Capnovum's cognitive compliance management platform provides an up-to-date repository of regulations, obligations and regulatory news; that lets financial institutions manage compliance and resource utilisation across jurisdictions. Artificial intelligence is leveraged to understand and identify synergies between regulations, assess the footprint of business models and impact of regulatory updates.

| Board Members | | Management Team | |
|--|---------------------|--------------------------------|--------------------------------------|
| Capnovum (Switzerland) Limited | | Inga Jovanovic, Niclas Nilsson | |
| Key Partners | Key Resources | | Key Activities |
| Alumni of "SuperCharger FinTech Accelerator" and "Momentum London" | Employees in 2018 | 1-10 | Programming & Engineering |
| | ...of which in CH | 1-10 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |


Cashare AG
www.cashare.ch
Founded in 2008

Category Deposit & Lending

Location Zug

Valuation

As an innovative company in the FinTech area, we are the pioneer and biggest Crowdlending platform in Switzerland. With our products we serve individual and SME borrowers as well as investors with fair interest rates and liquidity in a secured environment. A fully automatized approach supports the business case and scaling.

| Board Members | | Management Team | |
|---|---------------------|--|--------------------------------------|
| Jan Mörmann, Tom Ludescher, Alfred Mettler, Dominik Witz, Oscar Heira | | Michael Borter, Roger Müller, Endre Marczy, Sanji Lingam | |
| Key Partners | Key Resources | | Key Activities |
| PwC, Global Fintech Association, sharecon, Swiss Finance Startups, Bisnode, Crif, Creditreform, AXA | Employees in 2018 | 14 | Programming & Engineering |
| | ...of which in CH | 14 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**CashSentinel SA**

Founded in 2012
Location Vaud

www.cashsentinel.com

Category Payment
Valuation

CashSentinel builds and operates an Escrow payment contract engine. It is used in B2C and B2B models in the automotive industry. It is also used in SaaS by other parties (payment operators, Fintechs), to process escrow payments on other use-cases.

| Board Members | | Management Team | |
|--|---------------------|--|--------------------------------------|
| Jean-Frédéric Thomas, Michael Chaille, Sylvain Bertolus, Jean Pascal | | Sylvain Bertolus, Milena Nikolic, Stéphane Ongagna | |
| Key Partners | Key Resources | | Key Activities |
| Société Générale, Swissquote Bank, Worldline SIX Payment Services, Protekta, Allianz | Employees in 2018 | 10 | Programming & Engineering |
| | ...of which in CH | 6 | Marketing / Finding Clients |
| | Total Funding (CHF) | 1,700,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**CB Financial Services AG**

Founded in 2010
Location Graubünden

www.c-b-f-s.com

Category Payment
Valuation

Client identification, client onboarding, document signing services, global secure payment services.

| Board Members | | Management Team | |
|--------------------------------------|---------------------|-----------------------------|--------------------------------------|
| Marcel F. Komminoth | | Roland Rütimann, Markus Hug | |
| Key Partners | Key Resources | | Key Activities |
| Braingroup AG, Netcetera, Inventx AG | Employees in 2018 | 10 | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



c-crowd AG
 Founded in 2010
 Location Zurich

www.c-crowd.com
 Category Deposit & Lending
 Valuation

Together with Raizers, our strategic partner and European crowdfunding platform, c-crowd brings together innovative entrepreneurs and investors.

| Board Members | | Management Team | |
|-------------------------------------|---------------------|--|--------------------------------------|
| Christoph Laib, Philipp Steinberger | | Christoph Laib, Dominic Lüthi, Philipp Steinberger | |
| Key Partners | Key Resources | | Key Activities |
| Raizers | Employees in 2018 | 0 | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



Clear Minds Investment AG
 Founded in 2016
 Location Zurich

www.clearminds.ch
 Category Investment Management
 Valuation

Clear Minds offers regulatory compliant digital ADVISORY process for B2B2C, fully integrating partners' proprietary investment & communication processes to serve end client with their existing solutions.

| Board Members | | Management Team | |
|---|---------------------|---|--------------------------------------|
| Alexa Ipen-Providoli, Alexander Raviol, Stephan Schmid, Adrian Schatzmann, Jürg Steiger | | Jürg Christian Steiger, Nils Patrik Ludvig Hansson, Adrian Schatzmann | |
| Key Partners | Key Resources | | Key Activities |
| TPS, Futurae, Djangostars, Swissquote | Employees in 2018 | 11 | Programming & Engineering |
| | ...of which in CH | 4 | Marketing / Finding Clients |
| | Total Funding (CHF) | 330,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Confinale AG**

Founded in 2012
Location Zug

www.confinale.ch

Category Banking Infrastructure
Valuation

Confinale is a Swiss software development and consulting company, that specialises in digitalisation projects for the banking sector, whereby it focuses on tax, compliance and wealth-advisory.

| Board Members | | Management Team | |
|--|---------------------|--|--------------------------------------|
| Thomas Twerenbold, Roland Staub, Jonas Misteli | | Roland Staub, Jonas Misteli, Andreas Egli, Florian Schrag, Fabian Erni | |
| Key Partners | Key Resources | | Key Activities |
| SIX, PwC, Avaloq, Investment Navigator, Flowable, Appway | Employees in 2018 | 56 | Programming & Engineering |
| | ...of which in CH | 52 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Contovista AG**

Founded in 2013
Location Zurich

www.contovista.com

Category Banking Infrastructure
Valuation

Contovista is specialised on data analytics, business intelligence and visualisation over financial data. Contovista's software automatically categorises all bank transactions and visualises aggregations with easy to understand charts.

| Board Members | | Management Team | |
|---|---------------------|---|--------------------------------------|
| Gian Reto à Porta, Nicolas Cepeda, Roland Zwysig, Daniel Anders | | Gian Reto A Porta, Nicolas Cepeda, Fabio Bernasconi | |
| Key Partners | Key Resources | | Key Activities |
| Aduno Group, Finnova, Avaloq, Netcetera, TI&M, True Wealth, Synpulse, NDGIT | Employees in 2018 | 30 | Programming & Engineering |
| | ...of which in CH | 30 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**CoreLedger Labs GmbH**

Founded in 2017

Location Zug

www.coreledger.net

Category Distributed Ledger Technology

Valuation CHF 50,000,000

CoreLedger merges the real and virtual world and makes Blockchain-enabled smart contracts easy and simple to use. Our intention is to reinvent global and direct trade by allowing the easy digitization on a blockchain of any good or service.

| Board Members | | Management Team | |
|--|---------------------|--|--------------------------------------|
| Johannes Schweifer, Stefan Latzer, Richard Zbinden | | Johannes Schweifer, Jevgenijs Fjodorovics, Richard Zbinden | |
| Key Partners | Key Resources | | Key Activities |
| Blocklogix, Cryptomedia, inacta, tokengate.io | Employees in 2018 | 12 | Programming & Engineering |
| | ...of which in CH | 8 | Marketing / Finding Clients |
| | Total Funding (CHF) | 2,500,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Crealogix AG**

Founded in 1996

Location Zurich

www.crealogix.com

Category Banking Infrastructure

Valuation CHF 150,000,000

The CREALOGIX Group is an independent Swiss software house and the market leader for Digital Banking in Switzerland, ranked in the global FinTech Top 100 list.

| Board Members | | Management Team | |
|---|---------------------|--|--------------------------------------|
| Bruno Riche, Richard Dratva, Christoph Schmid, Ralph Movicato, Ruedi Noser | | Thomas Avedik, Richard Dratva, Philippe Wirth, Volker Weimer, David Moreno, Oliver Weber | |
| Key Partners | Key Resources | | Key Activities |
| CGi, Cognizant, DXC, HPE, Oracle, redhat, Inventx, Meniga, unblu, Entersekt, Silverlake, Adesso, Sofgen, Promon, Syngenio, Zeb, Qumram, Qontis, Vasco, among others | Employees in 2018 | >750 | Programming & Engineering |
| | ...of which in CH | 200 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



Credit Exchange AG
 Founded in 2018
 Location Zurich

www.creditexchange.ch
 Category Deposit & Lending
 Valuation

Development of an open exchange for mortgages business; fundamentally innovate and digitalize the mortgage market; Transparency and comparability for the end client; Significant efficiency improvements through decomposition of the value chain as well as separation of distribution, servicing and investors.

| Board Members | | Management Team | |
|---|---------------------|--------------------------------------|--------------------------------------|
| Fabio Perlini, Johannes Höhener, Reto Kuhn, Sven Rump | | Hanspeter Ackermann, Andrea Canonica | |
| Key Partners | Key Resources | | Key Activities |
| Clientis Zürcher Regionalbank, EY, Glarner Kantonalbank, die Mobiliar, Vaudoise, Swisscom | Employees in 2018 | 5 | Programming & Engineering |
| | ...of which in CH | 5 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



Creditfolio AG
 Founded in 2017
 Location Basel

www.creditfolio.ch
 Category Deposit & Lending
 Valuation

Creditfolio is a crowdlending platform with a focus on consumer loans.

| Board Members | | Management Team | |
|---------------------------------|---------------------|---------------------------------|--------------------------------------|
| Alex Hediger, Tobias Winkelmann | | Alex Hediger, Tobias Winkelmann | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

CreditGate24

CreditGate24 (Schweiz) AG

Founded in 2015
Location Zurich

www.creditgate24.com

Category Deposit & Lending
Valuation

CreditGate24 offers financing solutions for private customers, businesses and real estate customers by providing innovative and state of the art products. At the same CreditGate24 offers a variety of investment options with attractive returns.

| Board Members | | Management Team | |
|---|---------------------|---|--------------------------------------|
| Josef Rickenbacher, Stefan Benkert, Alexander Marti, Anne-Marie Müller-Kempin, Christoph M. Mueller | | Christoph M. Mueller, Stefan Benkert, Paul Baumgartner, Zujca Cekov, Peter Boschung, Stephan Zimmermann | |
| Key Partners | Key Resources | | Key Activities |
| Bank Frick, Generali, Leonteq, Bexio, Hypothekarbank Lenzburg | Employees in 2018 | 28 | Programming & Engineering |
| | ...of which in CH | 27 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



creditworld AG

Founded in 2015
Location Zug

www.creditworld.ch

Category Deposit & Lending
Valuation

The online marketplace for SME financing in Switzerland.

| Board Members | | Management Team | |
|--|---------------------|--|--------------------------------------|
| Philipp Schnyder, Philipp Schneider, Kai Ren | | Philipp Schnyder, Philipp Schneider, Kai Ren | |
| Key Partners | Key Resources | | Key Activities |
| Euler Hermes, Wenger & Vieli | Employees in 2018 | 11 | Programming & Engineering |
| | ...of which in CH | 8 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Crowd4Cash - Crowd Solutions AG****www.crowd4cash.ch**

Founded in 2016

Category Deposit & Lending

Location Zug

Valuation

We are an innovative FinTech Company, specialized in Crowdlending. We bring investors and borrowers together – 100 % online. We enable lower interest rates to borrower and attractive returns to investors.

| Board Members | | Management Team | |
|---|---------------------|--|--------------------------------------|
| Peter Oesch, Roger Bossard | | Roger Bossard, Frank Meierhofer, Andreas Oehninger | |
| Key Partners | Key Resources | | Key Activities |
| Several financial advisors, other FinTech companies | Employees in 2018 | 7 | Programming & Engineering |
| | ...of which in CH | 6 | Marketing / Finding Clients |
| | Total Funding (CHF) | 560,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Crowdhouse AG****www.crowdhouse.ch**

Founded in 2015

Category Deposit & Lending

Location Zurich

Valuation

Crowdinvesting in carefully selected Swiss Real Estates. Every Investor gets his own entry in the land register.

| Board Members | | Management Team | |
|--|---------------------|---------------------------------|--------------------------------------|
| Ardian Gjeloshi, Robert Plantak, Francisco Fernandez | | Robert Plantak, Ardian Gjeloshi | |
| Key Partners | Key Resources | | Key Activities |
| Luzerner Kantonalbank, Raiffeisen, Glarner Kantonalbank, Liechtensteinische Landesbank, Wüest & Partner, PwC, Quali Casa, SVIT | Employees in 2018 | 110 | Programming & Engineering |
| | ...of which in CH | 110 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Crowdpark SA**

Founded in 2017
Location Geneva

www.crowdpark.ch

Category Deposit & Lending
Valuation

Crowdpark SA is an independent company specialized in Swiss Real Estate Crowd-Investing.

| Board Members | | Management Team | |
|----------------------|---------------------|----------------------|--------------------------------------|
| Sébastien Demartines | | Sébastien Demartines | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 2 | Programming & Engineering |
| | ...of which in CH | 2 | Marketing / Finding Clients |
| | Total Funding (CHF) | 100,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**CRYPTO FINANCE****Crypto Finance AG**

Founded in 2017
Location Zug

www.cryptofinance.ch

Category Distributed Ledger Technology
Valuation

Crypto Finance AG is a financial technology company founded in June 2017. The company provides blockchain-related services through its three divisions Asset Management, Brokerage and Storage.

| Board Members | | Management Team | |
|--|---------------------|---|--------------------------------------|
| Raymond J. Baer, Marc P. Bernegger, Philipp Cottier, Jan Brzezek, Pascal Forster, Tobias Reichmuth | | Jan Brzezek, Lewin Boehnke, Mauro Melchionna, Simon Trippel | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 40 | Programming & Engineering |
| | ...of which in CH | 40 | Marketing / Finding Clients |
| | Total Funding (CHF) | 17,500,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



Cryptoprofiler - Riskifier
 Founded in 2017
 Location Zurich

www.cryptoprofiler.com
 Category Analytics
 Valuation

Empowering better cryptocurrency investment decisions by bringing banking-grade investor risk profiling and product risk classification into the crypto space.

| Board Members | | Management Team | |
|--|---------------------|------------------------------------|--------------------------------------|
| Gino Wirthensohn, Jelena Jakovleva | | Gino Wirthensohn, Jelena Jakovleva | |
| Key Partners | Key Resources | | Key Activities |
| Local and global cooperation partners in the cryptocurrency space. | Employees in 2018 | 5 | Programming & Engineering |
| | ...of which in CH | 3 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



Custodigit AG
 Founded in 2018
 Location Zurich

www.custodigit.com
 Category Distributed Ledger Technology
 Valuation

Digital Asset Custody Platform. The Swiss pioneering solution for regulated financial services providers.

| Board Members | | Management Team | |
|--|---------------------|--|--------------------------------------|
| Manuel Krieger, Robert Gebel, Roger Wüthrich-Hasenböhler | | Peter Hofmann, David Watrin, Andreas Pages | |
| Key Partners | Key Resources | | Key Activities |
| Swisscom, Metaco, Algotrader | Employees in 2018 | < 10 | Programming & Engineering |
| | ...of which in CH | < 10 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**daura AG**

Founded in

2018

Location

Zurich

www.daura.ch

Category

Distributed Ledger Technology

Valuation

The company's objective is to digitise the shares of Swiss SMEs using Blockchain technology. The daura platform enables transfers of shares via blockchain transactions. These shares give unlisted companies access to the capital market. All the legal functions of the shares, such as the exercise of voting rights, are regulated in a smart contract and comply with Swiss regulations.

| Board Members | | Management Team | |
|--|---------------------|-----------------|--------------------------------------|
| Johannes Hoehener, Andreas Rudolf, Luka Müller-Studer, Roger Wüthrich-Hasenböhler | | Peter Schnürer | |
| Key Partners | Key Resources | | Key Activities |
| daura is a joint venture of MME and Swisscom. Further strategic Eco-System Partners will be onboarded in 2019. | Employees in 2018 | 1 | Programming & Engineering |
| | ...of which in CH | 1 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Decentriq AG**

Founded in

2017

Location

Zug

www.decentriq.ch

Category

Distributed Ledger Technology

Valuation

We enable businesses to benefit from cutting-edge cryptographic solutions. From anonymity preservation to zero knowledge, we shape answers that last.

| Board Members | | Management Team | |
|---|---------------------|-----------------|--------------------------------------|
| Alexander Katz, Maximilian Groth, Stefan Deml | | | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



Descartes Finance AG
 Founded in 2015
 Location Zug

www.descartes-finance.com
 Category Investment Management
 Valuation

Descartes is a leading digital Swiss wealth manager bringing together the latest insights in financial theory, leading technology, and successful investment specialists.

| Board Members | | Management Team | |
|--|---------------------|--|--------------------------------------|
| Adriano B. Lucatelli, Rino Borini | | Adriano B. Lucatelli, Marc Sauter, Roger M. Levola | |
| Key Partners | Key Resources | | Key Activities |
| Blackrock iShares, OLZ AG, Swiss Rock Asset Management, Lakefield Partners, DWS, UBS, Vontobel, Credit Suisse, ZKB, Julius Bär | Employees in 2018 | 7 | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | 1,300,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



Dufour Capital AG
 Founded in 2011
 Location Zurich

www.dufour-capital.ch
 Category Investment Management
 Valuation

A significant part of investment decisions will be digital and rule-based in the future. DC's value proposition is to provide investors access to attractive rule-based investment solutions and necessary IT-systems in a lean and cost-efficient way.

| Board Members | | Management Team | |
|---|---------------------|------------------------------|--------------------------------------|
| Ryan Held, Sascha Freimüller, Roman Timm, Werner Erismann, Marc Weber | | Ryan Held, Sascha Freimüller | |
| Key Partners | Key Resources | | Key Activities |
| VZ VermögensZentrum, iShares/BlackRock, ti&m | Employees in 2018 | 5 | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | 500,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

ECOFIN

Ecofin Holding AG

Founded in 1986
Location Graubünden

www.ecofin.ch

Category Investment Management
Valuation >CHF 50,000,000

ECOFIN's offering is based on three pillars: a cost-efficient wealth manager, a dedicated investment consultant and a digital solution provider for banks, asset managers, pension funds, trusts and family offices.

| Board Members | | Management Team | |
|---|---------------------|---------------------------------|--------------------------------------|
| Alexandra Janssen, Hans Kistler, Martin Janssen | | Martin Janssen, Christian Dicke | |
| Key Partners | Key Resources | | Key Activities |
| Our customers | Employees in 2018 | ~50 | Programming & Engineering |
| | ...of which in CH | ~50 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

eCollect®

eCollect AG

Founded in 2014
Location Zug

www.ecollect.org

Category Payment
Valuation

eCollect is a financial SaaS provided with RESTful API and a full featured web app to automate and optimise the full accounts payable and collection cycle.

| Board Members | | Management Team | |
|---|---------------------|---|--------------------------------------|
| Thimo Seidel | | Rossitza Radieva, Dimitar Nanov, Ilian Ivanov | |
| Key Partners | Key Resources | | Key Activities |
| eCollect Bulgaria EOOD, eCollect Germany GmbH | Employees in 2018 | | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | 400,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Element36 AG**

Founded in 2018
Location Zug

www.element36.io

Category Distributed Ledger Technology
Valuation CHF 1,400,000

We provide a bank-grade solid bridge between the old economy and the crypto world.

| Board Members | | Management Team | |
|--|---------------------|----------------------------------|--------------------------------------|
| Maurus Riedweg, Maik Blumenthal, Walter Strametz | | Walter Strametz, Maik Blumenthal | |
| Key Partners | Key Resources | | Key Activities |
| Consulteer, PXL.WDGTS | Employees in 2018 | 4 | Programming & Engineering |
| | ...of which in CH | 2 | Marketing / Finding Clients |
| | Total Funding (CHF) | 200,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Elvia e-invest AG**

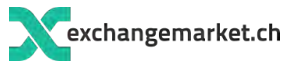
Founded in 2017
Location Zurich

www.elvia.ch

Category Investment Management
Valuation

Elvia e-invest is an online wealth management company and a whole owned subsidiary of Allianz Suisse. We help you to invest your assets in keeping with your situation in life. From just 5,000 francs, at low costs, with ETFs.

| Board Members | | Management Team | |
|---|---------------------|-----------------------------|--------------------------------------|
| Roger Faust, Bernard El Hage, Florian Stefan Faustmann, Stefan Hemp, Stefan Rapp, Irene Klauser | | Klaus Thaler, Daniel Schill | |
| Key Partners | Key Resources | | Key Activities |
| Allianz | Employees in 2018 | 10 | Programming & Engineering |
| | ...of which in CH | 10 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**EM Exchange Market GmbH**

Founded in 2016
Location Zurich

www.exchangemarket.ch

Category Payment
Valuation

Exchange Market enables people to do currency exchanges.

| Board Members | | Management Team | |
|---|---------------------|--|--------------------------------------|
| Michael Wychowanec, Maria Vasquez-Wychowanec | | Michael Wychowanec, Maria Vasquez-Wychowanec | |
| Key Partners | Key Resources | | Key Activities |
| Genevaer Kantonalbank, Swiss Finance Startups, Zürcher Kantonalbank | Employees in 2018 | 5 | Programming & Engineering |
| | ...of which in CH | 3 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Enterprise Bot GmbH**

Founded in 2017
Location Zug

www.enterprisebot.org

Category Analytics
Valuation

Enterprise Bot is an Artificial Intelligence company that provides white-labeled cognitive solutions in several languages to improve customer service and create operational efficiency for large corporate clients.

| Board Members | | Management Team | |
|---|---------------------|---------------------------|--------------------------------------|
| Pranay Jain, Ravina Mutha, Penny Schiffer | | Pranay Jain, Ravina Mutha | |
| Key Partners | Key Resources | | Key Activities |
| PwC, SIX Group, Generali, SWICA and SBB | Employees in 2018 | 17 | Programming & Engineering |
| | ...of which in CH | 5 | Marketing / Finding Clients |
| | Total Funding (CHF) | 500,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



ERI Bancaire SA
 Founded in 1989
 Location Geneva

www.eri.ch
 Category Banking Infrastructure
 Valuation

ERI is an international company, specialising in the design, development, implementation and support of an integrated, real-time banking software package: the OLYMPIC Banking System.

| Board Members | | Management Team | |
|--|---------------------|---|--------------------------------------|
| Yehuda Assaraf, Monika Assaraf, Blaise Grosjean | | Jean-Philippe Bersier, Nicholas Hacking | |
| Key Partners | Key Resources | | Key Activities |
| Numerous other software suppliers in areas that our complementary to our offering. We are also corporate sponsors of the F10 start-up incubator in Zurich. | Employees in 2018 | ~400 | Programming & Engineering |
| | ...of which in CH | ~180 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



Etops AG
 Founded in 2010
 Location Schwyz

www.etops.ch
 Category Investment Management
 Valuation CHF 8,000,000

We consolidate all your assets over all your custodians. We give you the transparency and overview that you need to manage your assets. We digitize your portfolio. Anywhere. Anytime.

| Board Members | | Management Team | |
|----------------------------------|---------------------|-----------------|--------------------------------------|
| Pius Stucki, Thomas Arthur Huber | | Pius Stucki | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 41 | Programming & Engineering |
| | ...of which in CH | 10 | Marketing / Finding Clients |
| | Total Funding (CHF) | 0 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Evolute AG**

Founded in 2016
Location Zurich

www.evolute.com

Category Banking Infrastructure
Valuation

Evolute is a seamlessly integrated software, from client risk profiling to portfolio solutions, covering the entire value chain of wealth management. Evolute closely links advisors and clients along the way – enabled by technology.

| Board Members | | Management Team | |
|--|---------------------|--|--------------------------------------|
| Michael Hartweg, Kathleen DeRose, Patrick Barnert | | Michael Hartweg, Andreas Rufin, Markus A. Bühler, Mark Gustafson | |
| Key Partners | Key Resources | | Key Activities |
| Northfield Information Services, ThomsonReuters, CDDS, UnaVista, Investment Navigator, PwC | Employees in 2018 | 35 | Programming & Engineering |
| | ...of which in CH | 20 | Marketing / Finding Clients |
| | Total Funding (CHF) | 6,000,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**FinForm AG**

Founded in 2016
Location Bern

www.finform.ch

Category Banking Infrastructure
Valuation

Finform standardizes, industrializes and digitalizes compliance formalities. We offer a complete digital customer onboarding & KYC formalities approving, for standard and complex cases.

| Board Members | | Management Team | |
|--|---------------------|--|--------------------------------------|
| Markus Fuhrer, Peter Delfosse, Patrick Graf, Markus Binzegger | | René Oppliger, Michael Rumpf, Mirco Calzolari, Stephan Käser | |
| Key Partners | Key Resources | | Key Activities |
| Axon Ivy, Axon FinTech, AxonActive, Post CH, Peax, Crif, Deloitte, Soranus | Employees in 2018 | >50 | Programming & Engineering |
| | ...of which in CH | 11 | Marketing / Finding Clients |
| | Total Funding (CHF) | 2,999,999 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



finnova AG Bankware
 Founded in 1974
 Location Aargau

www.finnova.com
 Category Banking Infrastructure
 Valuation

Finnova is a leading provider of end-to-end banking software in the Swiss financial centre.

| Board Members | | Management Team | |
|--|---------------------|---|--------------------------------------|
| Hans Zehetmaier, Stephan Frohnhoff, Walter Knabenhans, Charlie Matter, Hanspeter Rhyner, Marcel Walker | | Daniel Bernasconi, Jörg Steinemann, Simon Kauth, Hendrik Lang, Markus Metzger, Raphael Widmer | |
| Key Partners | Key Resources | | Key Activities |
| In addition to our strategic partners msg systems and Swisscom, Finnova maintains an actively managed network with more than 70 services, product and technology partners. | Employees in 2018 | 400 | Programming & Engineering |
| | ...of which in CH | 400 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



Flink AI AG
 Founded in 2017
 Location Zurich

www.flink.ai
 Category Analytics
 Valuation CHF 1,200,000

Flink AI develops advanced AI technology solutions for automated decision making in trading and investment.

| Board Members | | Management Team | |
|-------------------|---------------------|-----------------|--------------------------------------|
| Daniel Egloff | | Daniel Egloff | |
| Key Partners | Key Resources | | Key Activities |
| NVIDIA | Employees in 2018 | 8 | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Forctis AG**

Founded in 2017
Location Schwyz

www.forctis.io

Category Distributed Ledger Technology
Valuation CHF 9,000,000

Forctis is developing a digital asset representation model (and operating platform) based on a completely new take on the Blockchain. The salient features of the design philosophy are a polymorphic token (code-named ARES) to facilitate the representation of multiple asset classes, and the ability to hardwire a stable cryptocurrency as one asset class (code-named GenS) to facilitate transactions amongst assets represented in ARES.

| Board Members | | Management Team | |
|--|---------------------|--|--------------------------------------|
| Eduardo Salazar, Marc Degen, Isabelle Ganz, Marc Bettinger | | Eduardo Salazar, Marc Degen, Isabelle Ganz, Marc Bettinger | |
| Key Partners | Key Resources | | Key Activities |
| Stablecoin Foundation (founding member) | Employees in 2018 | | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Foxstone SA**

Founded in 2016
Location Geneva

www.foxstone.ch

Category Deposit & Lending
Valuation

Foxstone democratizes real estate investment by offering institutional quality opportunities to High Net Worth Individuals, Family Offices, Private Banks and Institutional Investors by increasing transparency and lowering the minimum investment amount.

| Board Members | | Management Team | |
|--|---------------------|-----------------|--------------------------------------|
| Michael Lahyani, Dan Amar | | Dan Amar | |
| Key Partners | Key Resources | | Key Activities |
| Vaudoise, Investis Group, Fintech Fusion, Swiss Crowdfunding Association | Employees in 2018 | 15 | Programming & Engineering |
| | ...of which in CH | 10 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

FUTURAE

Futurae Technologies AG

Founded in 2016

Location Zurich

www.futurae.com

Category Banking Infrastructure

Valuation

Futurae offers a strong suite of multi-factor authentication tools that provide a high degree of security and improve the customer experience while protecting the user's privacy.

| Board Members | | Management Team | |
|--|---------------------|---|--------------------------------------|
| Claudio Marforio, Sandra Tobler, Nikos Karapanos, Francois Robient, Thomas Hilgendorff | | Sandra Tobler, Claudio Marforio, Nikolaos Karapanos, Gaetano Mecenero | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 10 | Programming & Engineering |
| | ...of which in CH | 8 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



getBUTIK - Dublin IT GmbH

Founded in 2011

Location Zurich

www.getbutik.com

Category Payment

Valuation

All-in-one retail solution including iPad register and online shops for e-commerce amongst other helpful tools.

| Board Members | | Management Team | |
|---|---------------------|--------------------------------|--------------------------------------|
| Matthias Linherr, Fabio Dubler | | Matthias Linherr, Fabio Dubler | |
| Key Partners | Key Resources | | Key Activities |
| SIX, PostFinance, Data Quest, dpd, Innocard | Employees in 2018 | 4 | Programming & Engineering |
| | ...of which in CH | 4 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

green[::]match

greenmatch AG

Founded in 2013
Location Basel-Land

www.greenmatch.ch

Category Investment Management
Valuation

Greenmatch is a financial modelling platform and a marketplace for renewable energy projects. The software empowers project developers, investors and banks in making reliable decisions and in increasing the success of their transactions.

| Board Members | | Management Team | |
|--|---------------------|--|--------------------------------------|
| Matthias Stettler, Moris Isik, Andres Huber, Harald Zenke, Jan Lüchinger | | Moris Isik, Tobias Bitterli, Andreas Socin | |
| Key Partners | Key Resources | | Key Activities |
| All market participants in the renewable energy sector. | Employees in 2018 | 13 | Programming & Engineering |
| | ...of which in CH | 13 | Marketing / Finding Clients |
| | Total Funding (CHF) | 4,700,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



GWAP Financial Sarl

Founded in 2017
Location Geneva

www.gwapfinancial.com

Category Investment Management
Valuation

GWAP leverages technology and financial innovations to provide professional grade investment services, while lowering barriers to entry, such as investment minimums, and on-going costs.

| Board Members | | Management Team | |
|--|---------------------|---|--------------------------------------|
| Cristian-Viorel Gheorghe, Florin-Cristian Lohan, Cristina Gontaru | | Cristian-Viorel Gheorghe, Florin-Cristian Lohan, Cristina Gontaru | |
| Key Partners | Key Resources | | Key Activities |
| In discussions with traditional banks to provide white label wealth management solutions. Also cooperating with other FinTech players on the product side. | Employees in 2018 | 7 | Programming & Engineering |
| | ...of which in CH | 2 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Hyposcout AG**

Founded in 2016
Location Zurich

www.hypo-scout.ch

Category Deposit & Lending
Valuation

Hyposcout is a national company that has made it its purpose to connect investor and capital lender in the area of mortgage.

| Board Members | | Management Team | |
|--|---------------------|------------------------|--------------------------------------|
| Robert Simmen, Oliver Scheuerer, Michael Trübstein | | Jean-Pierre Pfenninger | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 4 | Programming & Engineering |
| | ...of which in CH | 4 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**ibani SA**

Founded in 2018
Location Geneva

www.ibani.com

Category Payment
Valuation CHF 4,250,000

ibani is a smart currency exchange mobile app where you can easily send and receive money without paying the high fees of banks.

| Board Members | | Management Team | |
|--|---------------------|---|--------------------------------------|
| Arnaud Salomon, Reynald Besson | | Arnaud Salomon, Jingyao Jin, Sébastien Krafft, Yann Gerardi | |
| Key Partners | Key Resources | | Key Activities |
| VQF, Swiss Finance + Technology Association, Fusion, LE B612 | Employees in 2018 | 4 | Programming & Engineering |
| | ...of which in CH | 4 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**IMburse AG**

Founded in 2018
Location Zurich

www.imbursepayments.com

Category Payment
Valuation

IMburse orchestrates transactions for the insurance industry and acts as a multi-plug for large/complex IT systems in the payments world. As a cloud-based “transaction as a service” platform our client can collect and pay out money in any market via any payment technology through just on eintegration (with us).

| Board Members | | Management Team | |
|---|---------------------|--|--------------------------------------|
| Carl Stempel, David Turner, Ralph Magicato, Oliver Werneyer | | Oliver Werneyer, Mark Jerome, David Turner, Carl Stempel | |
| Key Partners | Key Resources | | Key Activities |
| Visa, WorldPay, WorldLine, EY, Symbility Intersect | Employees in 2018 | 8 | Programming & Engineering |
| | ...of which in CH | 2 | Marketing / Finding Clients |
| | Total Funding (CHF) | 536,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



Club Invest in Swiss Real Estate.

ImmoYou AG

Founded in 2017
Location Zurich

www.immoyou.ch

Category Deposit & Lending
Valuation

ImmoYou is an innovative club Investment platform for real estate in Switzerland.

| Board Members | | Management Team | |
|---|---------------------|-----------------|--------------------------------------|
| Bettina Stach, Patrick Stach, Beat Rohrer, Urs Lenz | | Bettina Stach | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 6 | Programming & Engineering |
| | ...of which in CH | 6 | Marketing / Finding Clients |
| | Total Funding (CHF) | 13,000,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**InCube Group AG**

Founded in 2009
Location Zug

www.incubegroup.com

Category Investment Management
Valuation

InCube a Swiss based fintech and consulting company. Our team of highly skilled professionals focuses on intelligent and data-driven digitization of financial services. Our services cover data science, robotic process automation, bespoke software engineering and business consulting. InCube provides digital web-based B2B wealth management solutions.

| Board Members | | Management Team | |
|--|---------------------|---|--------------------------------------|
| Erich Felder, Daniel Lenz, André Pierre Müller, Boris Rankov | | Andreas Felber, Erich Felder, Daniel Lenz, Boris Rankov | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 30 | Programming & Engineering |
| | ...of which in CH | 25 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Instimatch Global AG**

Founded in 2016
Location Zurich

www.instimatch.ch

Category Deposit & Lending
Valuation

Instimatch is a platform which enables institutional lenders and borrowers to match their financing needs.

| Board Members | | Management Team | |
|--|---------------------|---|--------------------------------------|
| Michael Schmidt, Hugh Macmillen, Lamine Brahimi, Adrian Edelmann | | Daniel Sandmeier, Hugh Macmillen, Stephan Lüchinger, Hanspeter Werren | |
| Key Partners | Key Resources | | Key Activities |
| Vicenda Asset Management | Employees in 2018 | 8 | Programming & Engineering |
| | ...of which in CH | 6 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Integration Alpha GmbH**

Founded in 2014
Location Zug

www.integrationalpha.com

Category Analytics
Valuation

We built our data science platform 'ferris.ai' a kind of 'swiss army pocket knife' stitching all relevant open source data science tools into one 'enterprise-ready' platform, which is enriched by our industry use cases, data models, ontologies and other 'Lego-Piece'-components, allowing customer to build and consume Data Science within days, rather than months.

| Board Members | | Management Team | |
|---|---------------------|--|--------------------------------------|
| Tom Debus, Marco Selva, Frank Kaminsky | | Tom Debus, Marco Selva, Frank Kaminsky | |
| Key Partners | Key Resources | | Key Activities |
| Google for "ferris.ai", Azure (ferris.ai), DxC and AXIOM SL (Regulatory Reporting as a Service) | Employees in 2018 | 70 | Programming & Engineering |
| | ...of which in CH | 40 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Invemo GmbH**

Founded in 2017
Location Zug

www.invemo.ch

Category Distributed Ledger Technology
Valuation CHF 5,000,000

Invemo is a cryptocurrency mining company that constructs and operates mining facilities under the most effective economic conditions in the world.

| Board Members | | Management Team | |
|--|---------------------|--------------------------|--------------------------------------|
| | | Peter Kubli, Maxim Zimin | |
| Key Partners | Key Resources | | Key Activities |
| nvidia, G-20 Strategies AG, Grivas Management Consulting, ist-my.money | Employees in 2018 | 6 | Programming & Engineering |
| | ...of which in CH | 3 | Marketing / Finding Clients |
| | Total Funding (CHF) | 2,000,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Inventx AG**

Founded in

2010

Location

Graubünden

www.inventx.ch

Category

Banking Infrastructure

Valuation

Inventx is the Swiss IT partner for leading banks and financial institutions. The basis for our business activities are our values: innovation, interaction and Swissness.

| Board Members | | Management Team | |
|---|---------------------|--|--------------------------------------|
| Gregor Stücheli, Hans Nagel, Urs Saxer, Manuel Thiemann, Ivo Furrer | | Gregor Stücheli, Hans Nagel, Marco Camenisch, Patrick Hagen, Romano Seglias, Christoph Züger | |
| Key Partners | Key Resources | | Key Activities |
| Arcplace, Avaloq, Citrix, Crealogix, Huawei, IBM, ivanti, Finnova, Oracle | Employees in 2018 | 220 | Programming & Engineering |
| | ...of which in CH | 220 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**InvestGlass SA**

Founded in

2014

Location

Geneva

www.investglass.com

Category

Investment Management

Valuation

InvestGlass offers a streamlined solution for wealth and asset managers. On-boarding, CRM, CMS, PMS, MIFID2 LSFIN and more.

| Board Members | | Management Team | |
|--|---------------------|---|--------------------------------------|
| Alexandre Gaillard, Sebastien Thevenaz, FONGIT | | Alexandre Gaillard, Sebasiten Thevenaz, Diego Milla | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 5 | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | 100,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

investiere

venture capital

Investiere.ch - Verve Capital
Partners AG

Founded in 2010
Location Zug

www.investiere.ch

Category Deposit & Lending
Valuation

investiere.ch offers accredited private and institutional investors direct and professional access to start-up investments and is opening up the asset class venture capital to a wider audience.

| Board Members | | Management Team | |
|--|---------------------|---|--------------------------------------|
| Daniela Bosshardt-Hengartner, Michel Kaufmann, Ralph Zurkinder, Peter Quadri | | Steffen Wagner, Mike Hobmeier, Julien Pache, Lukas Weber, Richard Lockyer | |
| Key Partners | Key Resources | | Key Activities |
| Zürcher Kantonalbank, nest, Die Post, Corratierie Gestion | Employees in 2018 | 25 | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



INVESTMENT
NAVIGATOR

Investment Navigator AG

Founded in 2014
Location Zurich

www.investmentnavigator.com

Category Banking Infrastructure
Valuation

Investment Navigator is the go-to address for suitability. We enhance the investment & advisory value chain from research to distribution with suitability assessments; solving the cross-border distribution, product and tax suitability issues of financial institutions.

| Board Members | | Management Team | |
|---|---------------------|---|--------------------------------------|
| Julian Köhler, Jochen Gutbrod, Maurus Fries, Philipp Portmann, Alberto Rama | | Alberto Rama, Julian Köhler, Maurus Fries | |
| Key Partners | Key Resources | | Key Activities |
| Fundinfo, UBS, Lipper, KPMG | Employees in 2018 | 15 | Programming & Engineering |
| | ...of which in CH | 14 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**INVESTORY AG**

Founded in 2011
Location Zurich

www.investory.ch

Category Investment Management
Valuation

Digitizes and trades with the signals of investment strategies from financial experts across banks.

| Board Members | | Management Team | |
|---|---------------------|--------------------|--------------------------------------|
| Roger Fromm | | Roger Fromm | |
| Key Partners | Key Resources | | Key Activities |
| Cornèrtrader Cornèr Banca, Zuger Kantonalbank, Strateo Bank, Bank zweiplus, VP Bank, Banca CredInvest | Employees in 2018 | 1 + 10 freelancers | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | 525,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**iquant GmbH**

Founded in 2016
Location Zug

www.iquant.ch

Category Investment Management
Valuation

We develop rule-based investment strategies that outperform the market in the long term. We apply exclusively scientific models whose success has been documented in numerous studies.

| Board Members | | Management Team | |
|--|---------------------|-----------------------------------|--------------------------------------|
| Andreas Büchler, Oliver-Marcus Paesler, Manfred Schriefl | | Andreas Büchler, Manfred Schriefl | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 3 | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | 50,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**KOINA AG**

Founded in 2013
Location Nidwalden

www.koina.cc

Category Distributed Ledger Technology
Valuation CHF 5,000,000

KOINA is a sustainable monetary system processed by distributed ledger technology which enables self-issued credits for legal entities around the world.

| Board Members | | Management Team | |
|--|---------------------|-------------------------------|--------------------------------------|
| Daniel Neis, Peter Züllig | | Daniel Neis, Peter Züllig | |
| Key Partners | Key Resources | | Key Activities |
| Sapphire Labs, University of Vienna, Monneta (NGO) | Employees in 2018 | 1 & freelancers & contractors | Programming & Engineering |
| | ...of which in CH | 3 | Marketing / Finding Clients |
| | Total Funding (CHF) | 245,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Ledgy AG**

Founded in 2017
Location Zurich

www.ledgy.com

Category Banking Infrastructure
Valuation

The platform for companies, investors and employees to manage their equity and ESOPs.

| Board Members | | Management Team | |
|---|---------------------|--|--------------------------------------|
| Timo Horstschaefter, Yoko Spirig, Paul Ersin Sevinç, Christian Winkler, Cédric Köhler | | Timo Horstschaefter, Ben Brandt, Yoko Spirig | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 3 | Programming & Engineering |
| | ...of which in CH | 3 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**lend.ch - Switzerland AG**

Founded in 2016
Location Zurich

www.lend.ch

Category Deposit & Lending
Valuation

Lend.ch is the Swiss marketplace lending platform for corporate, consumer and mortgage backed loans.

| Board Members | | Management Team | |
|--|---------------------|--|--------------------------------------|
| Amir Suissa, Stefan Jaecklin, Florian Kübler | | Florian Kübler, Michel Lalive, Luzius Anderegg, Andreas Syz, Fatma Belbahi | |
| Key Partners | Key Resources | | Key Activities |
| Intrum, CRIF | Employees in 2018 | 13 | Programming & Engineering |
| | ...of which in CH | 12 | Marketing / Finding Clients |
| | Total Funding (CHF) | 7,800,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Lendico Schweiz AG**

Founded in 2016
Location Zurich

www.lendico.ch

Category Deposit & Lending
Valuation

Lendico provides an on-line alternative to classic bank loans. We help Swiss businesses with quick and easy financing solutions for their projects. In doing so, we are attractive for private and institutional investors interested in a new and thriving asset class. Lendico is a company of PostFinance.

| Board Members | | Management Team | |
|--------------------------------------|---------------------|---|--------------------------------------|
| Martin Stadler Hirzel, Philipp Merkt | | Myriam Reinle, Vincent van Seumeren, Timo Sturn, Christof Schmidhuber | |
| Key Partners | Key Resources | | Key Activities |
| Trustees, accounting software, banks | Employees in 2018 | 9 | Programming & Engineering |
| | ...of which in CH | 9 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Lendity AG**

Founded in 2018
Location Zurich

www.lendity.com

Category Deposit & Lending
Valuation

Investment and technology solutions for Private Debt. F10 participant.

| Board Members | | Management Team | |
|-------------------------------------|---------------------|-------------------------------------|--------------------------------------|
| Rafael Karamanian, Armen Karamanian | | Rafael Karamanian, Armen Karamanian | |
| Key Partners | Key Resources | | Key Activities |
| SIX, PwC, Julius Bar and F10 | Employees in 2018 | | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Lendora SA**

Founded in 2016
Location Vaud

www.lendora.ch

Category Deposit & Lending
Valuation

Lendora is a Swiss crowdlending platform that connects borrowers and investors online to make credit more accessible and investing more rewarding.

| Board Members | | Management Team | |
|--------------------------------|---------------------|-----------------|--------------------------------------|
| Simon Pelletier, Jonathan Bory | | Simon Pelletier | |
| Key Partners | Key Resources | | Key Activities |
| Swissquote Bank SA | Employees in 2018 | 3 | Programming & Engineering |
| | ...of which in CH | 3 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Loanboox - Swiss FinTech AG**

Founded in 2016
Location Zurich

www.loanboox.ch

Category Deposit & Lending
Valuation

Loanboox is the independent money- and capital market platform for public-sector and large corporations, institutional investors and banks. We revolutionize the B2B lending of credits, by making it simple and transparent.

| Board Members | | Management Team | |
|--|---------------------|--|--------------------------------------|
| Stefan Mühlemann, Andi Burri, Dario Zogg | | Stefan Mühlemann, Andi Burri, Dario Zogg, Ivo Francioni, Christian Klumpe, Dominique Hügli, Martina Bühler | |
| Key Partners | Key Resources | | Key Activities |
| I-CV (Independent Credit View) AG | Employees in 2018 | 40 | Programming & Engineering |
| | ...of which in CH | 20 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**LumRisk SA**

Founded in 2013
Location Vaud

www.lumrisk.com

Category Analytics
Valuation

A plug-and-play risk aggregation and reporting service providing rapid, transparent and high-quality portfolio risk data to help simplify complexity for investment decision making.

| Board Members | | Management Team | |
|--|---------------------|--|--------------------------------------|
| Arpad Busson, Stéphane Salino, Pierre Udriot | | Alejandro Bonilla, Jens Janke, Regino Alonso | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 14 | Programming & Engineering |
| | ...of which in CH | 14 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**meetinvest AG**

Founded in 2014
Location Zug

www.meetinvest.com

Category Investment Management
Valuation

Sharing investment knowledge to empower everyone and providing world class digital investment solutions to wealth management financial institutions.

| Board Members | | Management Team | |
|---|---------------------|-----------------------------------|--------------------------------------|
| Michel Jacquemai, Maria Jacquemai | | Michel Jacquemai, Maria Jacquemai | |
| Key Partners | Key Resources | | Key Activities |
| Integrated in the Temenos T24 core banking system (sandbox and Marketplace) | Employees in 2018 | 4 | Programming & Engineering |
| | ...of which in CH | 2 | Marketing / Finding Clients |
| | Total Funding (CHF) | 2,700,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**METACO****Metaco SA**

Founded in 2014
Location Vaud

www.metaco.com

Category Distributed Ledger Technology
Valuation

Established in 2014, METACO is a blockchain expert and leading provider of ultra-secure, fit-for-purpose distributed ledger infrastructure for financial institutions and enterprises. METACO's flagship product SILO is a digital asset custody infrastructure for financial institutions.

| Board Members | | Management Team | |
|---|---------------------|---|--------------------------------------|
| Jacques Grivel, Adrien Treccani, Francisco Fernandez, Olivier Laplace, Christopher Trevisan | | Adrien Treccani, Vincent Kobel, Seamus Donoghue | |
| Key Partners | Key Resources | | Key Activities |
| Guardtime, Avaloq, Temenos, Swisscom, Custodigit, Sygnum, SCX | Employees in 2018 | 16 | Programming & Engineering |
| | ...of which in CH | 16 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Monetha GmbH**

Founded in 2017
Location Zug

www.monetha.io

Category Distributed Ledger Technology
Valuation

The Monetha platform is a solution to build a censorship resistant and transferable reputation that is reliable and based on your behavior.

| Board Members | | Management Team | |
|--|---------------------|-----------------------|--------------------------------------|
| Andrej Ruckij, Justas Pikelis, Laurynas Jokubaitis | | Patrick Storchenegger | |
| Key Partners | Key Resources | | Key Activities |
| Perun Network, Peekdata, Techracers, VR Team | Employees in 2018 | | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | 37,000,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**MoneyPark AG**

Founded in 2011
Location Schwyz

www.moneypark.com

Category Banking Infrastructure
Valuation

MoneyPark offers independent advice on mortgage, retirement and pension planning as well as investments and combines it with an open architecture product shelf and the largest provider selection in the country.

| Board Members | | Management Team | |
|--|---------------------|---|--------------------------------------|
| Ralph Jeitziner, Samuel Hügli, Ralph-Thomas Honegger, Uwe Bartsch, Leo Grünstein, Stefan Heitmann, Reto Keller | | Stefan Heitmann, Benjamin Tacquet, Michael Hartmann | |
| Key Partners | Key Resources | | Key Activities |
| More than 100 partners (banks, insurances and pension funds) in Switzerland | Employees in 2018 | 150 | Programming & Engineering |
| | ...of which in CH | 150 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



Mt Pelerin Group SA
 Founded in 2017
 Location Geneva

www.mtpelerin.com
 Category Distributed Ledger Technology
 Valuation CHF 40,000,000

Mt Pelerin is creating a new kind of bank that will stop risking people's deposits, and instead give them the tools to take back control of their money.

| Board Members | | Management Team | |
|--|---------------------|---|--------------------------------------|
| Reynald Besson, Arnaud Salomon | | Arnaud Salomon, Reynald Besson, Jingyao Jin, Cyril Lapinte, Sébastien Krafft, Yann Gerardi, Laurent Aapro | |
| Key Partners | Key Resources | | Key Activities |
| Capital markets and technology association, Swiss Finance and Technology Association, Swiss Blockchain Association, Saxo Bank, ibani.com, FinTech Fusion | Employees in 2018 | 10 | Programming & Engineering |
| | ...of which in CH | 9 | Marketing / Finding Clients |
| | Total Funding (CHF) | 2,000,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



neon Switzerland AG
 Founded in 2017
 Location Zurich

www.neon-free.ch
 Category Banking Infrastructure
 Valuation

neon is an independent smartphone account.

| Board Members | | Management Team | |
|---|---------------------|---|--------------------------------------|
| Markus Oswald, Jörg Sandrock, Simon Youssef | | Michael Noorlander, Simon Youssef, Julius Kirscheneder, Jörg Sandrock | |
| Key Partners | Key Resources | | Key Activities |
| Hypothekarbank Lenzburg, Contovista, Intrum, Sonect, Develando, NDGIT | Employees in 2018 | 10 | Programming & Engineering |
| | ...of which in CH | 7 | Marketing / Finding Clients |
| | Total Funding (CHF) | 1,500,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**NetGuardians SA**

Founded in 2007
Location Vaud

www.netguardians.ch

Category Analytics
Valuation

NetGuardians is a leading FinTech company recognized for its unique approach to fraud and risk assurance solutions. Their software leverages AI to help financial institutions proactively prevent fraud.

| Board Members | | Management Team | |
|--|---------------------|---|--------------------------------------|
| Olivier Schneider, Olivier Trancart, Victor Orlovski, Orin Sauvageot | | Joel Winteregg, Raffael Maio, Michael Gingins, Jérôme Kehrl | |
| Key Partners | Key Resources | | Key Activities |
| Temenos, Swisscom, Adnovum, Orbium, Avaloq | Employees in 2018 | 80 | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | 14,500,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Oakura Ventures AG**

Founded in 2018
Location Zug

www.oakura.io

Category Distributed Ledger Technology
Valuation

Oakura increases startups' success by optimizing the startup-support activities of investors through digitization as well as by aligning incentives of supporting experts, whereas its blockchain based platform – the Oakonomy – acts as a scalable resource-aggregator for startups around the world.

| Board Members | | Management Team | |
|--|---------------------|---|--------------------------------------|
| Daniel Naeff, Christian Meisser | | Daniel Naeff, James Rhee, Pascal Kalbermatten | |
| Key Partners | Key Resources | | Key Activities |
| UZH Blockchain Center, ETH Juniors, LEXR | Employees in 2018 | 7 | Programming & Engineering |
| | ...of which in CH | 5 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**onedot AG**

Founded in 2014
Location Zurich

www.onedot.com

Category Analytics
Valuation

We are the leading provider of AI-powered data preparation technology.

| Board Members | | Management Team | |
|--|---------------------|--------------------------------|--------------------------------------|
| Dorian Selz, Urs Ehrismann, Bernhard Bicher, Tobias Widmer | | Bernhard Bicher, Tobias Widmer | |
| Key Partners | Key Resources | | Key Activities |
| SAP + several software vendors in commerce space | Employees in 2018 | 15 | Programming & Engineering |
| | ...of which in CH | 15 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Parashift AG**

Founded in 2017
Location Basel-Land

www.parashift.io

Category Banking Infrastructure
Valuation

Parashift offers API-based service to automate bookkeeping and accounting.

| Board Members | | Management Team | |
|--|---------------------|------------------------|--------------------------------------|
| Jakob Wenger, JH Heuin, Alessandro Micera, Pascal Toussaint, Alain Veuve | | Alain Veuve, JH Heuing | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 16 | Programming & Engineering |
| | ...of which in CH | 12 | Marketing / Finding Clients |
| | Total Funding (CHF) | 1,000,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**PassOn AG**

Founded in 2018
Location Zug

www.PassOn.com

Category Banking Infrastructure
Valuation

PassOn is an infrastructure which ensures that the access to digital assets never get lost. It allows everyone to plan, manage and execute succession and a fully secure ownership transfer of traditional and digital assets to beneficiaries as a reliable end-to-end solution.

| Board Members | | Management Team | |
|--|---------------------|----------------------------------|--------------------------------------|
| Remo Stieger, Stephan Wippermann, Raeto von Sprecher, Pascal Rellier, Kevin Wippermann, Valerio Roncone | | Remo Stieger, Stephan Wippermann | |
| Key Partners | Key Resources | | Key Activities |
| Swiss Stock Exchange SIX, University of St. Gallen, Supported by the Swiss Innovation Agency, Blockchain Partner, LeSwave, Paris&Co, gateB, Calydo, Hotz Brand Consultants | Employees in 2018 | 8 | Programming & Engineering |
| | ...of which in CH | 4 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Payment 21.com - Moving Media GmbH**

Founded in 2002
Location St. Gallen

www.payment21.com

Category Distributed Ledger Technology
Valuation

The award-winning Bitcoin cashier system of the company provides collection and exchange services to e-commerce merchants, multinational corporations, and financial intermediaries around the globe.

| Board Members | | Management Team | |
|-------------------|---------------------|-------------------|--------------------------------------|
| | | Bernhard Kaufmann | |
| Key Partners | Key Resources | | Key Activities |
| ACI Worldwide | Employees in 2018 | | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Pexapark AG**

Founded in 2017
Location Zurich

www.pexapark.com

Category Analytics
Valuation

Pexapark is quickly becoming the industry standard for selling renewable energy in the open market with its transaction platform PEXAconnect. Pexapark's mission: make selling renewable energy simpler and cheaper.

| Board Members | | Management Team | |
|---|---------------------|---|--------------------------------------|
| Michael Waldner, Luca Pedretti, Bernhard Raberger, Lukas Weissensteiner | | Michael Waldner, Luca Pedretti, Florian Müller, Christian Wehbe | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 21 | Programming & Engineering |
| | ...of which in CH | 14 | Marketing / Finding Clients |
| | Total Funding (CHF) | 5,750,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Polixis Sarl**

Founded in 2012
Location Geneva

www.polixis.com

Category Analytics
Valuation

Polixis is a Best-in-Class RegTech and Advisory firm. We are proud to serve some of the world's most demanding pool of customers, ranging from Tier 1 Global Banks to smaller, yet sophisticated players in need of Risk & Compliance solutions. ARDIS, our flagship software, stands for Applied Risk & Data Intelligence Solution. It is the next generation AML, Sanctions and KYC automation software, designed for both Front and Compliance Teams.

| Board Members | | Management Team | |
|-------------------|---------------------|---|--------------------------------------|
| | | Gagik Sargsyan, Oleksandr Andreyev, Vahan Avetisyan, Jean-Philippe Cavaillo | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 35 | Programming & Engineering |
| | ...of which in CH | 10 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Private Alpha Switzerland AG**

Founded in 2017

Location Luzern

www.privatealpha.de

Category Investment Management

Valuation

Private Alpha enhance existing investment strategies with artificial intelligence Technology

| Board Members | | Management Team | |
|--|---------------------|--|--------------------------------------|
| Christoph Gum, Andreas Perreiter, Christoph Züllig | | Christoph Gum, Christoph Züllig, Marco Tresch, Alan Solansky | |
| Key Partners | Key Resources | | Key Activities |
| Universal Investment mbH; Privatbank Berenberg | Employees in 2018 | 4 | Programming & Engineering |
| | ...of which in CH | 4 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**qashqade AG**

Founded in 2018

Location Zurich

www.qashqade.com

Category Investment Management

Valuation

qashqade is a FinTech Start-up focused on providing Private Equity solutions for GPs and LPs as well as for any private company who is in need of a Cashflow Analysis tool helping them to track their investors or shareholders.

| Board Members | | Management Team | |
|-------------------|---------------------|---------------------------------|--------------------------------------|
| Oliver Freigang | | Oliver Freigang, Gregor Kreuzer | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 2 + 5 third party employees | Programming & Engineering |
| | ...of which in CH | 2 | Marketing / Finding Clients |
| | Total Funding (CHF) | 500,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



Quotip - DmanD GmbH
 Founded in 2015
 Location Zurich

www.quotip.com
 Category Investment Management
 Valuation

Quotip is a management tool for structured investments and provides wealth managers turnkey access to a holistic array of services in three key areas: product idea generation, request-for-quote, audit/life-cycle-management.

| Board Members | | Management Team | |
|-------------------|---------------------|----------------------------|--------------------------------------|
| | | David Buehlmann, Rob Varga | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 3 | Programming & Engineering |
| | ...of which in CH | 3 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



Raizers SA
 Founded in 2014
 Location Vaud

www.raizers.com
 Category Deposit & Lending
 Valuation

Raizers is an online investment platform that allows every person or company to build and follow its own portfolio through a full catalogue of European SMEs, selected by our analysts team.

| Board Members | | Management Team | |
|--|---------------------|---|--------------------------------------|
| Maxime Pallain, Grégoire Linder, Alexandre Bernardi, Gabrielle Guirriec, Mansour Khalife, Edouard Burrus | | Maxime Pallain, Gregoire Linder, Gabrielle Guirriec | |
| Key Partners | Key Resources | | Key Activities |
| Piguet Galland | Employees in 2018 | 11 | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | 1,400,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Rigoblock - Rigo Investment Sagl****www.rigoblock.com**

Founded in 2013
Location Ticino

Category Distributed Ledger Technology
Valuation CHF 10,000,000

Rigoblock is an protocol for digital token management. It lowers the barriers to entry to asset management, making it universally accessible.

| Board Members | | Management Team | |
|--|---------------------|-----------------------------|--------------------------------------|
| Gabriele Rigo | | Gabriele Rigo, Hanna Keskin | |
| Key Partners | Key Resources | | Key Activities |
| Bitfinex, Ethfinex, TokenMarket, OxProject, H-Farm | Employees in 2018 | 4 | Programming & Engineering |
| | ...of which in CH | 2 | Marketing / Finding Clients |
| | Total Funding (CHF) | 300,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**ROCKZ AG****www.alprockz.ch**

Founded in 2018
Location Zug

Category Distributed Ledger Technology
Valuation CHF 6,000,000

ROCKZ is an international company active in the FINTECH scene and based in Switzerland. It offers its clients the possibility to buy and redeem ROCKZ, coins backed by Swiss Franc, the first product offered on its ROCKZ platform.

| Board Members | | Management Team | |
|---|---------------------|---|--------------------------------------|
| Yassine Ben Hamida, Alexey Borichev | | Yassine Ben Hamida, Alexey Borichev, Sebastien Hess, Marc Walpoth, Gabriel Rossetti, Hosam Mazawi | |
| Key Partners | Key Resources | | Key Activities |
| Swisscom Blockchain AG, Swisscom AG, Wisekey SA, Geneva Swiss Bank SA | Employees in 2018 | 16 | Programming & Engineering |
| | ...of which in CH | 10 | Marketing / Finding Clients |
| | Total Funding (CHF) | 850,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



Run my Accounts AG
 Founded in 2008
 Location Zurich

www.runmyaccounts.com
 Category Analytics
 Valuation

Accounting made simple. Run my Accounts has invented the automated accounting process for SME. We offer an end-to-end solution with personal services and support, enabling SMEs and startups to focus on their business.

| Board Members | | Management Team | |
|--|---------------------|--|--------------------------------------|
| Jean-Jacques Suter, Martin Schlatter, Christian Zenker | | Thomas Brändle, Andréina Plath, Nil Samuelsson | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 60 | Programming & Engineering |
| | ...of which in CH | 51 | Marketing / Finding Clients |
| | Total Funding (CHF) | 800,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



Seba Crypto AG
 Founded in 2018
 Location Zug

www.seba.swiss
 Category Distributed Ledger Technology
 Valuation

SEBA is a pioneer in the banking industry with the mission to build a FINMA supervised and progressive technological bridge between the traditional and the crypto worlds.

| Board Members | | Management Team | |
|---|---------------------|--|--------------------------------------|
| Guy Schwarzenbach, Reto Kunz, Urs Zulauf, Andreas Amschwand, Sebastien Merillat | | Guido Bühler, Philipp Baretta, Urs Bernegger, Guido Rudolphi, Thomas Nietlispach, Daniel Renner, Sibil Mellinger, Tobias Klein | |
| Key Partners | Key Resources | | Key Activities |
| SmartTrade, Loomis International, Taurus | Employees in 2018 | 22 | Programming & Engineering |
| | ...of which in CH | 22 | Marketing / Finding Clients |
| | Total Funding (CHF) | 100,000,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |


SecurionPay - Online Payments Group AG
www.securionpay.com
Founded in

2014

Category

Payment

Location

Schwyz

Valuation

The most innovative online and mobile payment platform for European businesses. SecurionPay is PSD2-ready payment gateway that helps merchants process transactions across the world, delivers superior end-user and developer experience thanks to flexible and robust APIs, and top-level security with AI-based tools and non-invasive 3D Secure authentication.

| Board Members | | Management Team | |
|------------------------------|---------------------|-----------------|--------------------------------------|
| Daniel Ronzani | | Lucas Jankowiak | |
| Key Partners | Key Resources | | Key Activities |
| European acquiring banks (5) | Employees in 2018 | 22 | Programming & Engineering |
| | ...of which in CH | 3 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |


SharesInside AG
www.sharesinside.com
Founded in

2016

Category

Banking Infrastructure

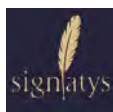
Location

Zurich

Valuation

The next generation platform for investors, listed companies and stock exchanges to engage.

| Board Members | | Management Team | |
|---------------------------------------|---------------------|-----------------|--------------------------------------|
| Yves Gelin, Bruno Vogt, Marco Caluori | | Dave Hannam | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 15 | Programming & Engineering |
| | ...of which in CH | 7 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Signatys Sarl**

Founded in 2011
Location Geneva

www.signatys.com

Category Banking Infrastructure
Valuation

At Signatys, we are building the unique standard of trust for datas and documents exchanges. We make exchanges and signatures of critical decisions as secure as making payments.

| Board Members | | Management Team | |
|---------------------------------|---------------------|--|--------------------------------------|
| Olivier Adler, Francoise Rochat | | Olivier Adler, Francoise Rochat, Pierr Le Floc'h | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 3 | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | 325,728 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Simplewealth AG**

Founded in 2015
Location Zurich

www.simplewealth.ch

Category Investment Management
Valuation

Simplewealth provides (a) online automated wealth management services to clients ("robo-adviser") and (b) also licences its automation tools to other wealth managers ("digital investment solution tools").

| Board Members | | Management Team | |
|---|---------------------|-----------------|--------------------------------------|
| Jérémy Cohen | | Jérémy Cohen | |
| Key Partners | Key Resources | | Key Activities |
| UBS, Blackrock, Deutsche Bank, Lyxor, Interactive Brokers | Employees in 2018 | 4 | Programming & Engineering |
| | ...of which in CH | 3 | Marketing / Finding Clients |
| | Total Funding (CHF) | 100,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**SIX Group AG**

Founded in 2008
Location Zurich

www.six-group.com

Category Banking Infrastructure
Valuation

SIX provides a comprehensive range of services in the areas of securities trading, settlement of securities transactions, financial information processing, and payment transactions.

| Board Members | | Management Team | |
|--|---------------------|--|--------------------------------------|
| Romeo Lacher, Sabine Keller-Busse, Herbert Scheidt, Jürg Bühlmann, Lorenz von Habsburg Lothringen, Stefan Helfenstein, Soren Mose, Shannon Thyme Klinger, Urs Beeler | | Jos Dijsselhoff, Daniel Schmucki, Jochen Dürr, Thomas Zeeb, Marco Menotti, Robert Jeanbart, Christoph Landis | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 2800 | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Smart Valor AG**

Founded in 2017
Location Zug

www.smartvalor.com

Category Distributed Ledger Technology
Valuation

Based in the Swiss Crypto Valley, SMART VALOR is a blockchain startup set to reinvent private banking. SMART VALOR established the first fully compliant security token exchange for Alternative Investments.

| Board Members | | Management Team | |
|----------------------------------|---------------------|---|--------------------------------------|
| Olga Feldmeier, Oliver Feldmeier | | Olga Feldmeier, Oliver Feldmeier, Julien Bringer, Thomas Felber | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 35 | Programming & Engineering |
| | ...of which in CH | 10 | Marketing / Finding Clients |
| | Total Funding (CHF) | 1,500,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



SmartMoneyMatch - 4Finance AG www.smartmoneymatch.com
Founded in 2015 *Category* Investment Management
Location Zug *Valuation* CHF 10,000,000

SmartMoneyMatch connects the global investment community. It offers a platform for investment products and service providers (matching search & find), due diligence exchange, RFPs, jobs, events, social network activities for the asset management industry.

| Board Members | | Management Team | |
|---|---------------------|-----------------|--------------------------------------|
| Martin Signer | | Martin Signer | |
| Key Partners | Key Resources | | Key Activities |
| See www.smartmoneymatch.com/business-directory | Employees in 2018 | 4 | Programming & Engineering |
| | ...of which in CH | 1 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



Spitch AG www.spitch.ch
Founded in 2014 *Category* Analytics
Location Zurich *Valuation*

Spitch uses AI-powered Natural Language Processing (NLP) and Natural Language Understanding (NLU) to provide Automatic Speech Recognition (ASR) and speech analytics as well as voice biometrics solutions in the enterprise segment. Spitch is the first company to produce an accurate speech-to-text engine for Swiss German dialects and a number of pioneering solutions to help improve customer experience and save costs.

| Board Members | | Management Team | |
|---|---------------------|---|--------------------------------------|
| Alexey Popov, Josef Novak, Elena Sakharova, Georgii Kravchenko, Igor Nozhov, Vadim Shchepinov | | Alexey Popov, Stephan Fehlmann, Igor Nozhov, Javier Dieguez, Juerg Schleier, Georg Theunissen, Piergiorgio Vittori, Vadim Shchepinov and others | |
| Key Partners | Key Resources | | Key Activities |
| Acapela, Avaloq, Audeering, Axelero, BSS, Crealogix, Genesys, Oracle, Swisscom and others | Employees in 2018 | 49 | Programming & Engineering |
| | ...of which in CH | 18 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



Splendit AG
 Founded in 2011
 Location Zurich

www.splendit.ch
 Category Deposit & Lending
 Valuation

We are Switzerland's first internet platform for student loans.

| Board Members | | Management Team | |
|---|---------------------|--|--------------------------------------|
| Michel Lalive d'Epinay, Florian Kübler | | Michel Lalive d'Epinay, Florian Kübler | |
| Key Partners | Key Resources | | Key Activities |
| IMD Lausanne, HSG St. Gallen, University of Bern Rochester, Uni Liechtenstein | Employees in 2018 | Employed at Switzerland | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | 300,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



Squirro - Nektoon AG
 Founded in 2013
 Location Zurich

www.squirro.com
 Category Analytics
 Valuation

Squirro is a cognitive insights engine that enables companies to turn meaningless data into actionable insights.

| Board Members | | Management Team | |
|--|---------------------|---|--------------------------------------|
| Radboud Vlaar, Patrice Neff, Ariel Lüdi, Dorian Selz, Alex Ott | | Dorian Selz, Toni Birrer, Patrice Neff, Tania Thiebach, Geraldine Teboul, Harry Fuecks, Michael Hubrich | |
| Key Partners | Key Resources | | Key Activities |
| Synpulse, AdNovum, Arvato Systems, Salesforce, ServiceNow | Employees in 2018 | 40 | Programming & Engineering |
| | ...of which in CH | 20 | Marketing / Finding Clients |
| | Total Funding (CHF) | 12,000,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |


**Status Research & Development
GmbH**

Founded in 2017
Location Zug

our.status.im

Category Distributed Ledger Technology
Valuation USD 59'845'731

Decentralised instant messenger, browser and wallet, to transact securely in an open source community committed to bringing the power of Ethereum and a more distributed internet to your pocket.

| Board Members | | Management Team | |
|---|---------------------|---|--------------------------------------|
| Yessin Omar Schiegg, Nabil Naghdy, Jarrad Hope, Carl Bennetts, Patrick Karl Storchenegger | | Yessin Omar Schiegg, Nabil Naghdy, Jarrad Hope, Carl Bennetts | |
| Key Partners | Key Resources | | Key Activities |
| Ethereum Community | Employees in 2018 | 75 | Programming & Engineering |
| | ...of which in CH | 7 | Marketing / Finding Clients |
| | Total Funding (CHF) | 106,000,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |


Stiftung DECENT

Founded in 2015
Location Zug

www.decent.ch

Category Distributed Ledger Technology
Valuation CHF 300,000,000

DECENT has developed their own blockchain protocol; DCore, a platform that empowers users to create or mitigate applications into a blockchain environment. With close cooperation with top investment funds and incubators, DECENT helps adapt to the decentralized future.

| Board Members | | Management Team | |
|---|---------------------|-----------------|--------------------------------------|
| Matej Michalko | | Matej Michalko | |
| Key Partners | Key Resources | | Key Activities |
| Media & entertainment and content distribution industry | Employees in 2018 | 130 | Programming & Engineering |
| | ...of which in CH | 5 | Marketing / Finding Clients |
| | Total Funding (CHF) | 5,820,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Swiss Crypto Tokens AG**

Founded in 2018

Location Zug

www.swisscryptotokens.ch

Category Distributed Ledger Technology

Valuation

The purpose of Swiss Crypto Tokens is to provide comprehensive services related to the issuing of tokens, including the issuance of own such tokens. The first token, a stablecoin XCHF, pegged to CHF, was launched in October 2018.

| Board Members | | Management Team | |
|-----------------------------------|---------------------|-----------------|--------------------------------------|
| Niklas Nikolajsen, Luzius Meisser | | Armin Schmid | |
| Key Partners | Key Resources | | Key Activities |
| Bitcoin Suisse AG as main partner | Employees in 2018 | 1 | Programming & Engineering |
| | ...of which in CH | 1 | Marketing / Finding Clients |
| | Total Funding (CHF) | 1,000,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Swiss Crypto Vault AG**

Founded in 2017

Location Zug

www.swisscryptovault.ch

Category Distributed Ledger Technology

Valuation

Swiss Crypto Vault developed a proprietary hyper secure cold storage solution. It applies the highest standards of cryptographic, IT and physical security as well as multi-party segregation and multi-signing features.

| Board Members | | Management Team | |
|--|---------------------|-------------------------------|--------------------------------------|
| Andrej Majcen, Ludwig Karl, Niels Nikolajsen | | Philipp Vonmoos, Richard Wynn | |
| Key Partners | Key Resources | | Key Activities |
| Bitcoin Suisse, PwC, Zühlke | Employees in 2018 | | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | 0 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Swiss Fin Lab GmbH**

Founded in 2016
Location Zurich

www.swissfinlab.com

Category Investment Management
Valuation

FINANCIAL LIFE GOALS: We empower banks and financial intermediaries to offer holistic goal-based investment advice and wealth planning through our proprietary and modular investment APIs.

| Board Members | | Management Team | |
|--------------------|---------------------|--|--------------------------------------|
| Bernhard Obenhuber | | Bernhard Obenhuber, Mark Andersen, Nicolas Camenzind, Axel Swoboda, Patrick Kranzlmüller | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 6 | Programming & Engineering |
| | ...of which in CH | 3 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Swissborg SA**

Founded in 2017
Location Vaud

www.swissborg.com

Category Distributed Ledger Technology
Valuation CHF 3,300,000

Whether you are an individual, a DAO or a financial expert, SwissBorg is a democratic ecosystem to manage a portfolio of crypto assets.

| Board Members | | Management Team | |
|--|---------------------|---|--------------------------------------|
| Christophe Diserens, Cyrus Fazel, Anthony Lesoismier-Geniaux | | Cyrus Fazel, Anthony Lesoismier, Nicolas Rémond, Jeremy Baumann | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 43 | Programming & Engineering |
| | ...of which in CH | 28 | Marketing / Finding Clients |
| | Total Funding (CHF) | 50,000,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Swisscom Blockchain AG**

Founded in 2017
Location Zurich

www.blockchain.swisscom.com

Category Distributed Ledger Technology
Valuation

Swisscom Blockchain provides blockchain infrastructure, advisory know how and solutions to implement blockchain technology quickly and successfully for your multiple industries.

| Board Members | | Management Team | |
|--|---------------------|---|--------------------------------------|
| Roger Wüthrich-Hasenböhler, Robert Gebel | | Roger Wüthrich-Hasenböhler, Kamal Youssefi, Sven Möller, Waldemar Scherer | |
| Key Partners | Key Resources | | Key Activities |
| Linxens, Secretarium, Daura, Custodigit | Employees in 2018 | 30 | Programming & Engineering |
| | ...of which in CH | 30 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**SwissLending SA**

Founded in 2015
Location Geneva

www.swisslending.com

Category Deposit & Lending
Valuation

The Swiss real estate crowdfunding specialist. SwissLending is the first crowdfunding platform in Switzerland specializing in loans for real estate professionals.

| Board Members | | Management Team | |
|-----------------------------------|---------------------|-----------------|--------------------------------------|
| Dominique Goy, Christophe Capelli | | Dominique Goy | |
| Key Partners | Key Resources | | Key Activities |
| Groupe Capelli | Employees in 2018 | 1 | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |


Swissquote Group Holding SA

Founded in 2000
Location Vaud

www.swissquote.ch

Category Banking Infrastructure
Valuation CHF 750,000,000

Swissquote Group is the Swiss leader in online banking.

| Board Members | | Management Team | |
|--|---------------------|---|--------------------------------------|
| Mario Fontana, Markus Dennler, Martin Naville, Jean-Christophe Pernollet, Beat Oberlin, Monica Dell'Anna | | Marc Bürki, Paolo Buzzi, Michael Ploog, Morgan Lavanchy, Gilles Chantrier | |
| Key Partners | Key Resources | | Key Activities |
| Postfinance, Basellandschaftliche Kantonalbank | Employees in 2018 | 633 | Programming & Engineering |
| | ...of which in CH | 555 | Marketing / Finding Clients |
| | Total Funding (CHF) | 325,000,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |


Sygnum AG

Founded in 2018
Location Zurich

www.sygnum.com

Category Distributed Ledger Technology
Valuation

Sygnum is a technology-driven company that empowers financial services for the digital asset economy. It develops an integrated solution to securely issue, store, trade and manage digital assets. Sygnum is rooted in two of the world's leading financial hubs – Singapore and Switzerland.

| Board Members | | Management Team | |
|--|---------------------|---|--------------------------------------|
| Luka Müller, Chua Kim Leng, Johannes Höhener, Gabriela Maria Payer, Thomas Buess, Mathias Imbach, Manuel Krieger | | Manuel Krieger, Mathias Imbach, Gerald Goh, Stefan Müller, Guido Hüppin, Roland Schwinn, Stephan Welti, Fabian Dori, Armin Müller | |
| Key Partners | Key Resources | | Key Activities |
| Swisscom, Custodigit (joint venture with Swisscom), daura | Employees in 2018 | 30 | Programming & Engineering |
| | ...of which in CH | 22 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Systemcredit AG**

Founded in 2018
Location Zurich

www.systemcredit.com

Category Deposit & Lending
Valuation CHF 3,000,000

Systemcredit is Switzerland's independent marketplace for SME-financing. Systemcredit helps quality small to medium sized businesses to get suitable loans faster and at better terms, whilst enabling participating lenders to expand their loan portfolio with less process and more efficiently.

| Board Members | | Management Team | |
|---|---------------------|------------------------------|--------------------------------------|
| Daniel Christen, Daniel Bont, Thomas Billeter | | Daniel Christen, Stefan Jost | |
| Key Partners | Key Resources | | Key Activities |
| Bank Cler, swisspeers, Fintech Fusion | Employees in 2018 | 3 | Programming & Engineering |
| | ...of which in CH | 3 | Marketing / Finding Clients |
| | Total Funding (CHF) | 350,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Systemorph AG**

Founded in 2011
Location Zurich

www.systemorph.com

Category Banking Infrastructure
Valuation

Systemorph develops Enterprise Data Management solutions that revolutionize actuarial, reporting and risk functions in financial services companies.

| Board Members | | Management Team | |
|-----------------------------------|---------------------|---|--------------------------------------|
| Roland Bürgi | | Roland Bürgi, Thomas Jörg, Pedro Fonseca, Daniel Trzesniak, Markus Kleiner, Bernd Jäckels, Gabriel Zarnauskas | |
| Key Partners | Key Resources | | Key Activities |
| Synpulse, KPMG, EY, PwC, Deloitte | Employees in 2018 | 40 | Programming & Engineering |
| | ...of which in CH | 16 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Taurus Group AG**

Founded in 2018
Location Geneva

www.taurusgroup.ch

Category Distributed Ledger Technology
Valuation

Taurus is a financial services firm specialized in digital assets and blockchain. It was founded by senior executives from the finance and cybersecurity industries. Its offering is based on three pillars: (1) Taurus-Trade: digital assets brokerage and exchange, (2) Taurus-Invest: digital assets investment solutions, and (3) Taurus-Protect: enterprise-grade digital assets cold storage vault for Banks, Asset Managers and Exchanges.

| Board Members | | Management Team | |
|---|---------------------|---|--------------------------------------|
| Lamine Brahimi, Sébastien Dessimoz, Oren-Oliver Puder | | Lamine Brahimi, Sébastien Dessimoz, Oren-Oliver Puder | |
| Key Partners | Key Resources | | Key Activities |
| ELCA, Swiss Federal Institute of Technology (EPFL) | Employees in 2018 | 12 | Programming & Engineering |
| | ...of which in CH | 12 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**TaxLevel AG**

Founded in 2017
Location Zurich

www.taxlevel.ch

Category Banking Infrastructure
Valuation CHF 8,000,000

We are the "Bloombergs" for tax-relevant data, providing a "tax layer" for cooperation between all stakeholders. Our customers are financial intermediaries using our platform in the "as a service" approach.

| Board Members | | Management Team | |
|---|---------------------|-------------------------------------|--------------------------------------|
| Wolfgang Millat, Peter Strittmatter, Reinhard Stary, Manfred Köhl | | Wolfgang Millat, Peter Strittmatter | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 5 | Programming & Engineering |
| | ...of which in CH | 5 | Marketing / Finding Clients |
| | Total Funding (CHF) | 100,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Tensor Technologies AG**

Founded in 2018

Location Zug

www.tensor-tech.io

Category Analytics

Valuation

At Tensor Tech we develop software and algorithms to trade in financial markets. We use the latest technologies to allow our small team to efficiently scale across many markets globally.

| Board Members | | Management Team | |
|--|---------------------|--|--------------------------------------|
| Andreas Meyer de Voltaire, Leo Rüst, Gerhard Pfister | | Andreas Meyer de Voltaire, Leo Rüst, Andreas Razen | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 12 | Programming & Engineering |
| | ...of which in CH | 12 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**theScreener Investor Services AG**

Founded in 2000

Location Zug

www.thescreener.com

Category Analytics

Valuation

We assist leading financial institutions to optimise advice and performance.

| Board Members | | Management Team | |
|---|---------------------|--|--------------------------------------|
| Andreas Lusser, Charles Tanner, Werner Schaeppi | | Farwagi Alain, Andreas Lusser, Robert Sheridan | |
| Key Partners | Key Resources | | Key Activities |
| Thomson Reuters, Factset, Morningstar, SIX, vwd, sungard, various IT suppliers. | Employees in 2018 | 30 | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Tilbago AG**

Founded in 2016
Location Luzern

www.tilbago.ch

Category Payment
Valuation

The founders of Tilbago AG enable companies to process debt collection proceedings online in an independent, easy and safe way. An intelligent assistant will guide the user through the full process.

| Board Members | | Management Team | |
|--|---------------------|-------------------------|--------------------------------------|
| Harley Krohmer, David Fuss, Reto Schneider, Mathias Strazza, Oliver Wolf | | David Fuss, Oliver Wolf | |
| Key Partners | Key Resources | | Key Activities |
| PostFinance | Employees in 2018 | 3 | Programming & Engineering |
| | ...of which in CH | 3 | Marketing / Finding Clients |
| | Total Funding (CHF) | 1,000,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**TimeStatement AG**

Founded in 2017
Location Zug

www.timestatement.com

Category Banking Infrastructure
Valuation CHF 5,000,000

TimeStatement is a modern cloud solution that allows you to track and bill your time quickly and easily. This enables you to check and manage your own team, and the respective project in real time. TimeStatement offers every freelancer the possibility to generate professional invoices with their own corporate identity with just a few clicks.

| Board Members | | Management Team | |
|-------------------|---------------------|-----------------|--------------------------------------|
| Daniel Bernard | | Daniel Bernard | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Tindec Financial Services AG**

Founded in 2010

Location Zug

www.tindecfs.com

Category Investment Management

Valuation

Tindec VISION is an award-winning front to back investment management platform. Our VISION CORE Technologies covers client, portfolio, risk and order management. VISION Investments suite provides tools to define and create systematic strategies to create performance, manage risk and implement systematic workflows as well as a dynamic, forward looking, multi-period, portfolio construction engine. VISION enables near-fully automated investment management of investment products/portfolios.

| Board Members | | Management Team | |
|--------------------------------------|---------------------|--------------------------------------|--------------------------------------|
| Michael Kaimakliotis, Neil McLachlan | | Michael Kaimakliotis, Neil McLachlan | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 10 | Programming & Engineering |
| | ...of which in CH | | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Tokengate.io - DSENT AG**

Founded in 2018

Location Zug

www.tokengate.io

Category Distributed Ledger Technology

Valuation CHF 4,000,000

An infrastructure component animating the new token economies by (1) onboarding people and businesses and (2) with tokenizing creating and distributing the new tokens like digital twins or crypto assets while meeting all security and regulatory requirements.

| Board Members | | Management Team | |
|--|---------------------|--------------------|--------------------------------------|
| Marco Bumbacher, Ralf Glabischnig | | Daniel Rutishauser | |
| Key Partners | Key Resources | | Key Activities |
| Bank Zarattini, Falcon Bank, Bank Frick, Crypto Brokers AG, Intrum, Lexpert Partners, Capital Management Partners AG, Crypto Consulting AG, Heymate, 4-arts Technologies, JUR, Swiss Crypto Exchange, CoreLedger, Ethereum, Liquid, EOS, NEO | Employees in 2018 | 5 | Programming & Engineering |
| | ...of which in CH | 5 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**TokenSuisse AG**

Founded in 2017
Location Zug

www.tokensuisse.com

Category Distributed Ledger Technology
Valuation CHF 15,000,000

TokenSuisse AG is a Blockchain Investment Advisor with the mission to provide simple access to the world of Blockchain Technologies and Crypto Assets. TokenSuisse offers the following services: Asset Management, Brokerage, Consulting.

| Board Members | | Management Team | |
|---|---------------------|---------------------------|--------------------------------------|
| Sacha Fedier, Raphael Suter, Viktor Walker, Alain Kunz, Claudio Rossi | | Alain Kunz, Claudio Rossi | |
| Key Partners | Key Resources | | Key Activities |
| TokenPay Swiss AG, ICONOMI Ltd. | Employees in 2018 | 6 | Programming & Engineering |
| | ...of which in CH | 6 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Tradeplus24 AG**

Founded in 2016
Location Zurich

www.tradeplus24.ch

Category Deposit & Lending
Valuation

An innovative financing solutions designed for KMU's helping them to optimise their working capital through tating up liquidity against domestic and international receivables.

| Board Members | | Management Team | |
|---|---------------------|--|--------------------------------------|
| Stephen Pike, Ben James | | Benjamin James, Martijn Corbee, Stephen Pike, Matthias Kribbel | |
| Key Partners | Key Resources | | Key Activities |
| CS, AIG, Walderwyss, Kessler, Intrum Justitia, Creditreform | Employees in 2018 | 7 | Programming & Engineering |
| | ...of which in CH | 7 | Marketing / Finding Clients |
| | Total Funding (CHF) | >1,000,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**True Wealth AG**

Founded in 2013
Location Zurich

www.truewealth.ch

Category Investment Management
Valuation

True Wealth is a Zurich based fintech company successfully operating a digital wealth management solution (robo advisor) in Switzerland.

| Board Members | | Management Team | |
|--|---------------------|--|--------------------------------------|
| Felix Niederer, Martin Spirig, Manuel Kunzelmann | | Felix Niederer, Silvio Böhler, Christoph Erb | |
| Key Partners | Key Resources | | Key Activities |
| BLKB | Employees in 2018 | 10 | Programming & Engineering |
| | ...of which in CH | 10 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Trustwise.io AG**

Founded in 2017
Location Basel-Land

www.trustwise.io

Category Distributed Ledger Technology
Valuation

trustwise.io ag provides an eco-friendly and regulatory compliant blockchain platform based on the Ethereum protocol operated and governed by an international consortium of companies, universities and public institutions under Swiss law. Businesses can govern and manage their financing, document the provenance of their products, provide insurances and incentive systems for their customers. The platform hosts a transparent and immutable public procurement system, climate incentive systems as well as citizen reward systems.

| Board Members | | Management Team | |
|---|---------------------|--|--------------------------------------|
| Adrian Hutzli, Christoph Niemann, Emanuel Dettwiler, Rolf Ramseier, Hans-Peter Gier | | Hans-Peter Gier, Michal Florian, Vlad Lupashevskiy, Nicolas Tsagarides | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 10 | Programming & Engineering |
| | ...of which in CH | 2 | Marketing / Finding Clients |
| | Total Funding (CHF) | >1,000,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



Utluna Solutions SA
 Founded in 2018
 Location Valais

www.utluna.com
 Category Analytics
 Valuation

Utluna - Monitor all your financial assets in one place. Understand what drives your performance & risks. Perfect your investment decisions.

| Board Members | | Management Team | |
|-------------------|---------------------|------------------------------------|--------------------------------------|
| Laurent Bruchez | | Laurent Bruchez, Florian Zermatten | |
| Key Partners | Key Resources | | Key Activities |
| Stealth mode | Employees in 2018 | 3 | Programming & Engineering |
| | ...of which in CH | 2 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



visionand AG
 Founded in 2017
 Location Zug

www.visionand.ch
 Category Investment Management
 Valuation

vision& is a Swiss based asset manager giving qualified investors the opportunity to allocate funds to the new crypto asset class with the ease of traditional investing.

| Board Members | | Management Team | |
|--|---------------------|--|--------------------------------------|
| Christian Schüpbach, Lidia Bolla | | Christian Schüpbach, Lidia Bolla, Jan Roth | |
| Key Partners | Key Resources | | Key Activities |
| Bank Frick, University of Basel, MAMA, PMG Fonds, Bitcoin Association Switzerland, Mercury, Grant Thornton, VQF, Crypto Valley, Alethena | Employees in 2018 | 4 | Programming & Engineering |
| | ...of which in CH | 4 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |



WEALTHARC

WealthArc GmbH

Founded in 2015
Location Zurich

www.wealtharc.com

Category Investment Management
Valuation

WealthArc is a next generation wealth management platform for external asset managers. It offers PMS and CRM, including digital client interaction, real-time portfolio analytics and automatic custodian consolidation.

| Board Members | | Management Team | |
|--|---------------------|--|--------------------------------------|
| Krzysztof Marcin Gogol | | Chris Gogol, Radomir Mastalerz, Silvan Fornaro | |
| Key Partners | Key Resources | | Key Activities |
| Refinitiv, Microsoft, Swisscom, Google | Employees in 2018 | 25 | Programming & Engineering |
| | ...of which in CH | 7 | Marketing / Finding Clients |
| | Total Funding (CHF) | 2,500,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**WeCan.Fund****WeCan.Fund SA**

Founded in 2015
Location Geneva

www.wecan.fund

Category Deposit & Lending
Valuation

Our team is supporting private and public organizations in implementing innovative technologic solutions, which we believe can participate to a more collaborative and sustainable economy. We are contributing to this adoption by our academic involvement, our participation to international events and by the creation of different professional associations.

| Board Members | | Management Team | |
|---|---------------------|---|--------------------------------------|
| Kim Andrée Potvin, Olivier Collombin, Philippe Perles | | Vincent Pignon, Fabio Sofia, Dominique Goy, Thomas Giacomo, Roxana Pirjolea | |
| Key Partners | Key Resources | | Key Activities |
| Arcanite, Request, Bity, Lemonway, Six | Employees in 2018 | 10 | Programming & Engineering |
| | ...of which in CH | 10 | Marketing / Finding Clients |
| | Total Funding (CHF) | 2,000,000 | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| Saas | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

**Yova AG**

Founded in

2017

Location

Zurich

www.yova.ch

Category

Investment Management

Valuation

Yova makes it easy to invest in companies that create positive environmental and social impact - without compromising your financial returns.

| Board Members | | Management Team | |
|--|---------------------|---|--------------------------------------|
| Helmut Fink, Erik Gloerfeld, Tillmann Lang | | Tillmann Lang, Erik Gloerfeld, Christoph Birkholz | |
| Key Partners | Key Resources | | Key Activities |
| | Employees in 2018 | 10 | Programming & Engineering |
| | ...of which in CH | 10 | Marketing / Finding Clients |
| | Total Funding (CHF) | | Operative Business / Serving Clients |
| Customer Segments | | Channels | |
| B2B National | B2B International | Digital Only | Digital & Personal |
| B2C National | B2C International | Personal Only | |
| Revenue Models | | | |
| SaaS | Commission | Trading | Licence Fee |
| Interest | Advertising | Data | |

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Appendix A

Additional information on the eight relevant building blocks according to the Business Model Canvas of Osterwalder and Pigneur (2010):

Key Partners

Key partners comprise the most important relationships a company needs in order to successfully deliver its value proposition. In the field of FinTech, many companies partner up with financial institutions or financial infrastructure providers in order to benefit from their established customer base. The financial institutions and infrastructure providers, on the other hand, benefit from the innovative power of FinTech companies and their sophisticated technological know-how. The key partners are evaluated in order to detect important partners in the FinTech sector.

Key Resources

The building block “Key Resources” includes the most important assets of a company which are required to operate its key activities (see next segment) and ultimately to deliver its value proposition. We distinguish between two types of key resources: First, human capital, measured in full-time equivalents, and second, financial resources, measured in the total amount of funds raised.

Key Activities

Key activities refer to the tasks a company is currently focussing on in order to execute its value proposition. They typically change over the business life cycle of a company: Whereas FinTech start-ups primarily focus on developing and launching their solution and finding first clients, established companies are increasingly active in operating their business. Our empirical analysis of the business models of FinTech companies distinguishes between the three key activities “Programming & Engineering”, “Marketing/Finding Clients” and “Operative Business/Serving Clients”, which may not necessarily be mutually exclusive. In particular, a company can either focus on setting up its website, platform, or mobile application (“Programming & Engineering”), on marketing its solution in order to establish or extend the customer base (“Marketing/Finding Clients”), or on running its daily business and serving the already established customer base (“Operative Business/Serving Clients”).

Value Proposition

The value proposition is the core of any business model. It encompasses the characteristics of a company’s offering intended to differentiate itself from the competition and to satisfy the customer’s needs. In FinTech, this differentiation is often achieved by developing alternative services, products or processes or by applying new technologies to established solutions. In the factsheets in chapter 9 the value proposition of a particular company is included in its company description.

Customer Relationships/ Channels

Since the building blocks “Channels” and “Customer Relationships” both focus on the way a company communicates and distributes its offering to their customers, they are treated as a single block in this study. We distinguish between three different types of how a company can interact with its customers. Firstly, the interaction can be fully digital, for example via the company’s platform, website, app, or other digital communication tools. The client hence does not need to personally communicate with the company to use its services or products. Second and contrary to the first type, the company pursues a fully personal interaction strategy. The customers thus is required to personally interact with the company, for example by phone, email or face-to-face communication, in order to use a particular product or service. The third type comprises a hybrid strategy with a part of the company’s services or products are conveyed digitally, whereas other aspects require personal communication. In some cases, the customers themselves are motivated to freely choose their preferred channel of interaction with the company.

Customer Segments

Customer segments summarize a group of customers which a company is aiming to sell its products and services to. We distinguish between the type of target customers, i.e. private individuals or businesses, and their geographical location, i.e. international (including Switzerland) or solely Swiss-based.

Revenue Models

The building block “Revenue Model” refers to the models of how a company generates income from its business activities. FinTech companies can either earn money by revenue models that are common in the financial industry such as interest, commission or trading, by approaches from the software industry such as licensing fees or Software-as-a-Service (SaaS), or by rather new models like selling advertising space or (analysed) data. Since many FinTech companies offer a broad range of products and services, the revenue models are not mutually exclusive.

| Key Resource | Description |
|---------------------|---|
| Capital | Indicates how much financial capital the company has raised until now. |
| Number of Employees | Indicates how many human resources are currently deployed to develop, maintain and/or distribute the company’s products and services. Additionally, the expected number of FTE by the end of 2018 is evaluated. |

| Key Activity | Description |
|--|---|
| Programming & Engineering | The company is currently focussing on setting up its website, platform, or app. |
| Marketing/Finding Clients | The company is currently focussing on finding customers. |
| Operative Business/ Serving Clients | The company is currently focussing on running its daily business and serving the already established customer base. |

| Customer Relationship/ Channel | Description |
|-----------------------------------|---|
| Digital Only | A client does not need to personally communicate with the company to use its services or products. Communication happens via the company’s platform, website, app, or other digital communication tools. |
| Personal Only | The company’s service requires personal communication and does not include any online tools. |
| Digital & Personal | A part of the company’s services or products are conveyed digitally, but other aspects require personal communication via e-mail, telephone, face-to-face, or other channels. Hence, the company pursues a hybrid communication strategy. |

| Customer Segment | Description | |
|------------------|-------------------------------------|--|
| Customer Type | B2C (<i>Business-to-Customer</i>) | The company’s main customers are private individuals. |
| | B2B (<i>Business-to-Business</i>) | The company’s main customers are other businesses. |
| Geography | Switzerland | The company focuses on serving customers in Switzerland. |
| | International | The company focuses on serving international customers (Switzerland included). |

| Revenue Model | Description |
|---------------------------------------|---|
| Interest | The company earns interest rate income. |
| Commission | The company receives commissions for services or products delivered. |
| Trading | The company actively trades in financial markets. |
| Licensing Fees | The company licenses products or software and receives licensing fees. |
| SaaS (<i>Software-as-a-Service</i>) | The company offers centralised hosting of business applications. |
| Advertising | The company sells advertising space. |
| Data | The company gathers vast amounts of data and sells or analyses the data itself. |

Appendix B

Indicator sources of the FinTech hub ranking:

| Publisher | Factor | Source | Dimension |
|--|-----------------------------------|---|-----------------|
| 2THINKNOW | Innovation cities | Innovation Cities Index 2018 | Technological |
| Adecco Group | Labour force quality | The Global Talent Competitiveness Index 2018 | Social |
| AT Kearney | Global Cities Report City | A.T. Kearney 2018 Global Cities Report | Social |
| Ernst & Young | FinTech adoption ranking | EY FinTech Adoption Index 2017 | Economic |
| Hays | Global Skills Index | The Hays Global Skills Index 2018 | Social |
| Henley & Partners | Visa restriction | Henley & Partners Passport Index 2018 | Political/Legal |
| HSBC | Expat ranking | League Table HSBC Expat Explorer Survey | Social |
| IMD | World talent | IMD World Talent Ranking 2018 | Social |
| Institute for Economics and Peace | Global Peace Index | Vision of humanity 2018 Global Peace index | Political/Legal |
| International Labour Organization | Knowledge-intense employment | ILOSTAT Database of Labour Statistics | Social |
| | Female employment advanced degree | ILOSTAT Annual Indicators | Social |
| International Monetary Fund | Credit to private sector | International Financial Statistics and data files and World Bank and OECD GDP estimates | Economic |
| | Domestic market size | World Economic Outlook Database | Economic |
| | Foreign direct investments | International Financial Statistics and Balance of Payments databases, World Bank, International Debt Statistics and World Bank and OECD GDP estimates | Economic |
| International Telecommunication Union | ICT access | Measuring the Information Society 2017 | Technological |
| | ICT use | Measuring the Information Society 2017 | Technological |
| | Cybersecurity Index | Global Cybersecurity Index 2017 | Technological |
| | Mobile cellular subscriptions | Measuring the Information Society 2017 | Technological |
| KPMG | Corporate tax rates | Corporate tax rates table | Political/Legal |
| Mercer | Costs of living city | Mercer's cost of living city 2018 | Social |
| | Quality of life | Mercer's quality of living city ranking 2018 | Social |
| OECD | PISA ranking | Programme for International Student Assessment (PISA) | Social |
| PwC | Ease of paying taxes | PwC database | Social |
| QS Quacquarelli Symonds Ltd | University ranking | QS World University Ranking | Social |

| Publisher | Factor | Source | Dimension |
|---|---|--|-----------------|
| Reporters without Borders | Press freedom index | World Press Freedom Index 2018 | Political/Legal |
| Tax Justice Network Limited | Financial Secrecy Index | Financial Secrecy Index 2018 | Economic |
| The Global Entrepreneurship and Development Institute | GEDI 2018 | Global Entrepreneurship Index 2018 | Economic |
| The World Bank | Applied tariff rate | TRAINS database, WTO Integrated Data Base and CTS database | Economic |
| | Cost of redundancy dismissal | Ease of Doing Business Index 2018: Reforming to Create Jobs | Political/Legal |
| | Ease of getting credit | Ease of Doing Business Index 2018: Reforming to Create Jobs | Economic |
| | Ease of protecting minority investors | Ease of Doing Business Index 2018: Reforming to Create Jobs | Economic |
| | Resolving insolvency | Ease of Doing Business Index 2018: Reforming to Create Jobs | Economic |
| | Gov. effectiveness | Worldwide Governance Indicators 2017 | Political/Legal |
| | Political stability | Worldwide Governance Indicators 2017 | Political/Legal |
| | Regulatory quality | Worldwide Governance Indicators 2017 | Political/Legal |
| | Starting a business | Ease of Doing Business Index 2018: Reforming to Create Jobs | Economic |
| | Infrastructure quality | The World Bank LPI dataset – global rankings 2018 | Social |
| | Human capital | Human Capital Index and components 2018 | Social |
| Total value of stocks traded | World Bank's World Development Indicators database, total value of % of GDP | Economic | |
| The World Bank and Turku School of Economics | Logistics performance | Logistics Performance Index 2016, Connecting to Compete 2016, Trade Logistics in the Global Economy – The Logistics Performance Index and its Indicators | Social |
| Thomson Reuters | Joint venture deals | Thomson One Banker Private Equity, SDC Platinum database | Economic |
| | Venture capital deals | Thomson One Banker Private Equity, SDC Platinum database | Economic |
| Transparency International | Corruption Perception Index | Corruption Perceptions Index 2017 | Political/Legal |
| UBS | Purchasing power city | UBS purchasing power filtered by net annual income | Economic |
| | Wage level | UBS Earning levels 2018 | Economic |

| Publisher | Factor | Source | Dimension |
|--|---|---|---------------|
| UNESCO Institute for Statistics | Expenditure on education | UIS online database 2008–2017 | Social |
| | Gov. Expenditure on education per pupil | UIS online database 2008–2017 | Social |
| | Graduates in Science and Engineering | UIS online database 2008–2017 | Social |
| | Expenditure on R&D | UIS online database 2008–2017 | Technological |
| | Number of students from abroad | UIS online database 2008–2017 | Social |
| | Pupil-teacher ratio | UIS online database 2008–2017 | Social |
| | Research talents in businesses | UIS online database 2008–2017 | Technological |
| | Researchers | UIS online database 2008–2017 | Technological |
| | School life expectancy | UIS online database 2008–2017 | Social |
| | Tertiary enrolment | UIS online database 2008–2017 | Social |
| United Nations | High-tech imports | Comtrade database; Eurostat, “High-technology” aggregations | Technological |
| United Nations | Gov. Online services | e-Government Survey 2016 | Technological |
| Public Administration Network | E-participation | e-Government Survey 2016 | Technological |
| World Economic Forum | Global cities competitiveness | The Global Competitiveness Report 2017–2018 World Economic Forum | Economic |
| | Cluster development | Executive Opinion Survey | Social |
| | University-industry collaboration | Executive Opinion Survey | Technological |
| World Federation of Exchanges | Market capitalisation | World Federation of Exchanges database; extracted from the World Bank’s World Development Indicators database 2008–2016 | Economic |
| World Intellectual Property Organization | Patents in at least two offices | WIPO, Intellectual Property Statistics; International Monetary Fund, World Economic Outlook Database | Technological |
| World Trade Organization | ICT services imports | Trade in Commercial Services database | Technological |
| | IP payments | Trade in Commercial Services database | Technological |
| Z/Yen Group | GFCI City | Global Financial Centers Index | Economic |

Appendix C

Key words and corresponding word stems from the annual report text analysis:

| | | |
|-------------------|------------------|--------------------|
| algorithm | deep | neuronal |
| analytics | detection | onboarding |
| api | dezentralis | paymit |
| application | digital | peer |
| artificial | distribution | PFM |
| authentication | ebanking | p2p |
| authentifizierung | ebill | proptech |
| automated | ethereum | psd |
| automati | fintech | qr |
| automatisierung | gamifikation | regtech |
| bimometrics | ico | remittance |
| biometrics | incubator | robo |
| bitcoin | innovat | roboti |
| blockchain | insuretech | schwarm |
| cashless | internetofthings | smart |
| chatbot | kontaktlos | softwareasaservice |
| cloud | krypto | token |
| coin | learning | transformation |
| commerce | ledger | twint |
| contactless | legaltech | virtual |
| crowd | machine | wallet |
| cryptocurrency | marketplace | web |
| cryptography | mining | |
| decentralization | mobile | |

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