How bankers can become innovation leaders again

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Summary

Expectations of bank clients are changing. Primarily as a consequence of digitisation. Whether in the form of disruption, revolution or evolution, the fact that major changes are taking place in the banking sector as a consequence of new technology cannot be denied. Established banks, new FinTech companies, supervisory authorities and other parties are all jostling for position in the new banking landscape. What remains unchanged is the essence of the financial services as offered, up until recently, almost exclusively by banks. In other words, while the banking sector may change, the essence of banking remains the same.

Banking continues to be about keeping clients' assets and accompanying data safe, keeping a payment system operational, mediating between savers and borrowers (the transformation function of banks), and absorbing the associated risks. What is new is that there are now providers in the form of FinTech and BigTech[1] which offer clients alternatives for each of these core tasks (or parts thereof) which are based on new technologies. For each of the core tasks referred to, clients expect a more digital service and their wishes are becoming increasingly measurable and audible for financial service providers.These changes form a new basis, for both new players and existing banks, to truly place the client at the centre of things, to serve them better and to provide better, more transparent, cheaper and more reliable products and services. The technological developments and the changes in consumer behaviour therefore not only constitute a threat for banks, but also certainly offer opportunities for an improved, more relevant service to clients. Banks that know how to make the most of these opportunities will be able to play an essential role in the new banking landscape.[2]

Established banks and new players are not necessarily diametrically opposed. Pure competition is making way for various forms of collaboration. Supervisory bodies and regulators are realising that certain changes can no longer be in the interest of clients.

[1] FinTech are young challengers to the established banking order that, particularly on the basis of their state-of-the-art IT and the scalability of the services, frequently offer cheaper, more client-oriented and faster alternatives to banking services. By BigTech we mean large technology companies that are adopting technological innovations and integrating them throughout the entire value chain. A more detailed definition of 'BigTech' can be found in the DNB report entitled 'Technological Innovation and the Dutch financial sector: Opportunities and risks for established institutions, newcomers & supervisory bodies' [Technologische innovatie en de Nederlandse financiële sector: Kansen en risico's voor gevestigde instellingen, nieuwkomers & het toezicht], page 20.

[2] Wherever we refer to 'banks' in this report, we mean the sector as a whole and generic trends and developments which are taking place in that sector. This may result in some terms or classifications not fully resonating with individual banks.

This report describes the technological and FinTech trends which affect the banking sector and how banks can use them to become more relevant to their clients. Based on the relevance formula, the factors of trust, convenience and low costs are discussed which may help banks to become innovative again.

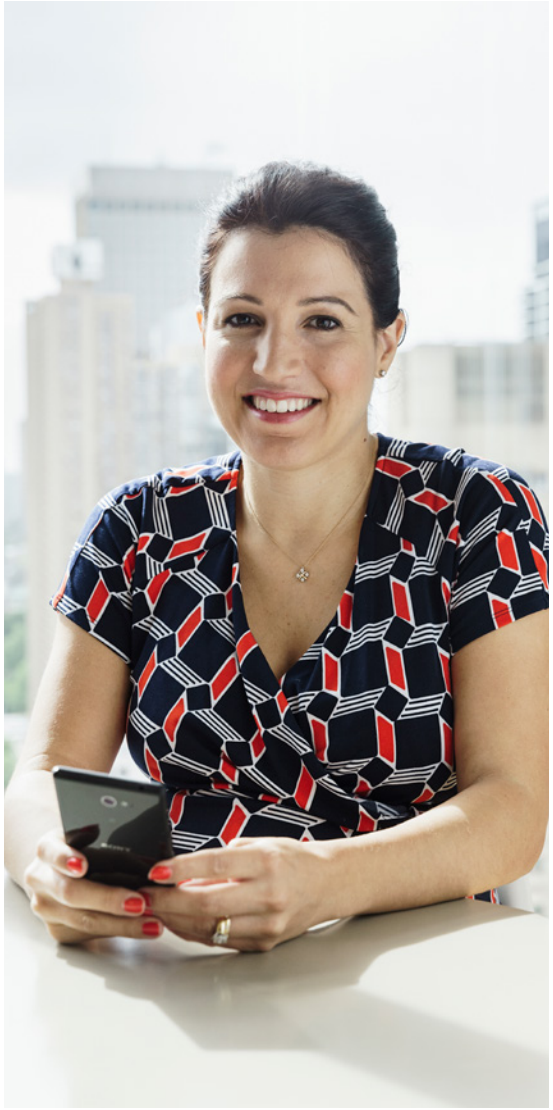
Point of departure

Over the centuries banks have always been FinTech companies avant la lettre. Even today, no other sector spends as much money on information technology (IT) as the banking sector. Although banks have continually invested in their infrastructure, large numbers of them still use outdated IT systems and infrastructure, referred to as the legacy. That is one of the reasons why existing banks are generally more expensive and less agile than new FinTech and BigTech parties. Incidentally, the term legacy includes more than just outdated IT systems and relates to agility in the widest sense and therefore also concerns processes, methods of working, skills, knowledge and mindset. We would also like to point out that the first generation of FinTechs are now also being confronted by forms of legacy in their IT systems.

Since the crisis, banks also have to deal with more and more regulation and more rigourous supervision, leading to increasing cost of compliance plus the increasing cost of compliance – including the burden on available capacity and budget – which are the consequences of that. Regarding compliance to some extend the playing field has become unlevel.

Finally, banks are still dealing with the impact of the consequences which the financial crisis had on the economy, including a mediocre investment climate and a drop in consumer trust.[3] Following the crisis, the major Dutch banks have also divested a substantial portion of their international and more risky activities. The scale required to be able to offer products and services cost efficiently has therefore partly been lost. The availability of capital is limited, as are the possibilities and the willingness to take risks, which are essential requirements for doing business. These factors are contributing to a decrease in the average return that banks make on equity. In the coming years this level of return is expected to barely exceed shareholders' expectation. Without a business model that structurally produces a healthy return, one of the pillars of the stability of financial systems and economies is crumbling. The latter is an important focal point for the ECB and one that it explicitly examines from the perspective of the Supervisory Review and Evaluation Process (SREP).

[3] Dutch Banking Association [Nederlandse Vereniging van Banken] – Trust Monitor [Vertrouwensmonitor] 2015



Technological developments

Set against this background, banks are increasingly facing a variety of technology-driven developments, which are changing client expectations and offering opportunities to banks to improve services. These days many business sectors, and therefore also banks, are facing so-called disruptive technologies, which are technologies that can be so powerful that they change entire sectors. These disruptive technologies usually concern the digitisation of existing processes and their uses in new areas. From the banks' perspective the following disruptive technologies, among others, are relevant:

***Advanced analytics**:* The term advanced analytics refers to techniques used to predict outcomes and find new correlations on the basis of large datasets, or big data. Banks can use advanced analytics internally, for example for portfolio risk management and for marketing purposes, such as reputation management and monitoring product launches.

Blockchain: A *blockchain* is a shared database in which participants record transactions and agreements with each other in a way which eliminates the need for a central party or a *trusted third party*. Blockchain technology offers the financial sector a great many potential benefits, particularly in the form of cost savings, but also because fewer intermediate parties are involved in transactions and because of the greater transparency and safety with regards to data and transactions.

Mobile: The expectation is that the mobile channel is going to be one of the primary channels for Internet banking, online payments and mobile payments in stores. Internet banking is already taking place on a large scale using mobile telephones and tablets, and mCommerce (online payments on a mobile carrier) is growing rapidly.

Artificial Intelligence, AI: Banks offer various applications ranging from digital (robo) advisers, to answering client questions on the website, to advanced *trading* algorithms and fully automated, algorithm-based credit approvals.

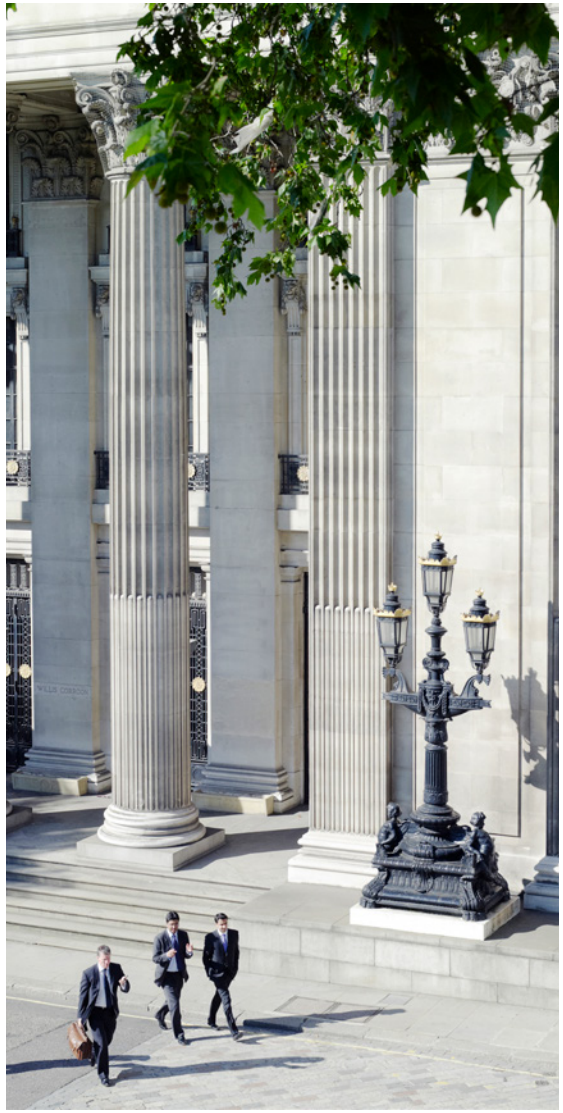
Internet of Things: The 'Internet of Things' (IoT) is a network of physical objects equipped with electronics, software, sensors and network connectivity with which these objects can exchange and collect data. The IoT for consumer applications is dominated by issues relating to privacy and security. It allows banks to help clients through, for example, the use of bank identification for the online identification at other organisations such as government bodies or webshops, or through the safe authorisation of payments via the IoT.

Cloud computing: The use of cloud solutions at banks currently varies from so-called *private clouds* (cloud solutions whereby the servers are used exclusively by the bank in question) to full outsourcing of the IT infrastructure to a public cloud solution. The possibility of being able to use the required IT infrastructure much more quickly, as well as the scalability, flexibility, and cost savings, are the main sources of motivation for banks to switch to *cloud computing*.

Biometrics: Biometric applications at banks usually concern authentication or authorisation by means of human characteristics such as fingerprints, iris scans, voice recognition or even face recognition. Biometrics can be used to make it easier for clients to interact with the bank, for example by simple authorisation of the payment or faster authentication ('I am who I say I am').

Robotics: Robotics is not only used when automating and improving current systems and processes, but also to improve the client experience. In addition to simple activities such as greeting clients, robotics enables client wishes and needs to be registered, and the best responses or solutions to be offered more quickly.

On the waves of these technological developments a new and rapidly growing group of FinTech companies has emerged that are young challengers to the established banking order that, particularly on the basis of their state-of-the-art IT and the scalability of the services, frequently offer cheaper and more client-oriented alternatives to banking services. The BigTechs, including household names such as Apple, Google, Facebook and Amazon, have the technological infrastructure and robust client relationships that have allowed them to secure a position in the banks' value chain, or even to absorb this value chain in its entirety. Technological developments are also having an indirect influence on banks, for example because they are leading to changes in client demand. In addition the playing field changes in response of legigslators and supervisory authorities. Improved client experiences outside the banking sector are producing super consumers, a growing group of bank clients who are continually imposing new and higher demands on services and user experiences, who are also less loyal to companies, brands, and other client groups. Incidentally, the new super consumer is not a client that requires only digital services. A large portion of these clients prefer a hybrid model of personal advice and digital services. Legislators and supervisory authorities have set themselves the goal of increasing competition, innovation, transparency and client satisfaction in the banking sector, thereby stimulating the emergence of new players, including FinTechs specifically. This will create a growing diversity of the solutions offered, from which clients will have to make informed choices. This means not only solutions offered by new players, but also solutions over which the client has control. One example of this are the so-called execution-only models, whereby the client purchases products without any advice from banks. This implies the risk of mis-buying for the client, meaning the risk of a client purchasing products which are unsuitable for their situation.These developments pose a dilemma for many established banks. On the one hand they are forced to maintain their legacy systems, while, on the other hand, they have to innovate and invest fully in new technologies in order to be able to respond effectively to changing client demands, new legislation and regulations, the need to reduce costs, and the emergence of new competition. In this respect, legacy IT infrastructure which established banks carry with them, is one of the largest barriers to innovation. Banks are aware of this and are actively working on solutions, although it continues to be a burden which puts them at a disadvantage compared to new players that do not have this problem. At the same time these developments offer opportunities to established banks. Although technologies and FinTech can be disruptive, they can also be used by banks themselves to improve services for clients, increase convenience, reduce costs and boost trust, for example through greater transparency. In this context we refer to '*enabling technologies*' and '*enabling FinTech*'. Talking about a situation



in which banks and new players are constantly diametrically opposed does not do justice to the complexity and the dynamics in of the banking landscape. These days, there is more and more talk about a development towards a new 'FinTech ecosystem' in which established banking service providers, FinTech start-ups and BigTech work together and compete with each other to develop and offer innovative bank products and services. Banks are - internally and remotely - setting up their own FinTech start-ups, are investing in, or acquiring, existing FinTechs, are integrating FinTech products into their own services and are, for example, participating in Blockchain consortia. The contribution by traditional banks to this innovative FinTech ecosystem is essential in order to stay relevant to clients, and possibly even in the interest of the client, as a provider of banking services.

The answer is to increase relevance

Banks will have to find answers to these developments both individually and collectively. Those answers must focus on maintaining and increasing their raison d'être or, in other words, their relevance. That *relevance* is determined by three factors: *trust*, *convenience* and *low costs*.

In this context, trust means that banks are reliable, or in other words predictable, transparent and honest towards their clients. By trust we also refer to the degree to which banks can make a useful and valued contribution to the society which they are part of. This is the foundation for the relevance of banks. Using new technologies can enhance this contribution in various ways. New technologies are increasing the ability of banks to comply with applicable legislation and regulations, both as regards their own actions and those of their clients, to offer greater transparency in financial services which will lead to more trust on the part of consumers and supervisory authorities and to create a greater insight into the risk positions of banks. This will make it easier to manage them and increase the stability of the financial system.

By *convenience* we mean the degree to which clients are satisfied with their user experiences in relation to the product and services provided by banks and about the speed, stability and simplicity which they experience in the interaction and communication with banks via their chosen channel. New technologies which banks can use to improve convenience for their clients include: the use of data to personalise the products and services they offer; the provision, via so-called aggregators or otherwise, of access to alternative providers; and the organisation of collaboration between banks themselves and with other providers, in order to stimulate the adoption of innovations.

Lastly, by *low costs* we mean the self-evident need for banks to keep the sales prices of their products and services at a level which is acceptable to clients. The cost structure of established banks, in which their office networks and their legacy

IT systems have a substantial share, puts them at a disadvantage compared to new players. What is more, banks are finding that their clients are not very willing to pay for banking products which, in their view, are utilitarian in nature. Lastly, digitisation reduces the value of a lot of banking products to little more than a commodity. Compared to banks and BigTechs that operate at global level, small and medium-sized banks will have to find other opportunities to achieve advantages of scale, with new technologies and FinTech offering the best options.

Initiatives

On the basis of this exploration of a number of technological developments, the emergence of FinTechs and the impact that these are having on the Dutch banking landscape, this report describes a number of initiatives which banks can take either individually or collectively, in order to strengthen the banking sector as a whole and increase their own relevance therein.

The question of which individual initiatives would be suitable reactions for the banks in the developments outlined, generally depends very much on their current position, their ambitions for the future and the strategic choices they have made. In any event, banks need to take action in response to the changes brought by those new technologies and the emergence of the FinTechs. This will require innovation in the field of trust, convenience and low costs to be marked as top priority on the management agendas, that sufficient time and money is made available and that there is a willingness to take risks and experiment. Only then will banks continue to be relevant for their clients. In connection to this, communication with the client and other interested parties is extremely important.

Banks are undergoing their own respective transitions as they deal in different ways with new technologies and FinTech. Of course all banks are involved in innovation to varying degrees by developing new concepts on the basis of new technologies. While doing so, some banks choose to build an entirely new digital bank alongside the traditional one while others transform themselves into an entirely new bank, with a business strategy which is tailored to the digital age.

Service providers and FinTech start-ups are working together and are competing with each other to develop and offer innovative banking products and services. Banks are - internally and remotely - setting up their own FinTech-start-ups, are investing in, or acquiring, existing FinTechs via accelerators, are integrating FinTech products into their own services and are, for example, participating in a blockchain consortium.

Lastly, there are a number of themes on which banks can take action together in order to benefit from new technologies and FinTech.

Actions potentially suited for a joint banking approach:

A ***dialogue with the society*** on, for example, the use of client data and the impact of such use on privacy and security.

A ***dialogue with legislators and regulators and supervisory authorities***, for example with regards to their task informing clients in the light of the increasing diversity of financial services offered. Any dialogue between the joint banks and authorities would also have to focus on creating the preconditions for a healthy innovation climate for both new parties and established banks (for example the regulatory sandbox to encourage experimenting, new light permit systems and tailoring supervision to activities rather than to entities).

Innovative projects which banks can undertake in the interest of their clients and which, by their nature, require the involvement of a large number of banks in the Netherlands. Examples are blockchain experiments in national/regional markets and the setting up of a Know-Your-Customer (KYC) utility.

A well-thought-out mix of such individual and joint initiatives will enable banks to make optimal use of the technological developments and the emergence of FinTech parties. Only in this way will the banks be able to maintain their relevance as financial service providers, to thrive from the opportunities which arise as a consequence of all the changes, and strengthen both the banking sector as a whole and their own position therein.

1. Introduction

The Netherlands has a rich history of financial innovation.[4] The Dutch East India Company [Verenigde Oost-Indische Compagnie, VOC], which was established in 1602, was the first public limited company with freely marketable shares. Thanks to the VOC, Amsterdam was able to develop into the global equity trading centre of the time. The Amsterdamse Wisselbank (Exchange Bank) which was established in 1609 (in what is now the Royal Palace Amsterdam) was an early forerunner of the central banks and fulfilled an indispensable financing function. In addition, the concept of 'bank money', which made giro-based payment transactions possible without the actual exchange of cash, the Lekdijk Bovendams debt instrument of 1624, which is the oldest known and still interest paying bond in the world, and 'Eendragt Maakt Magt', which was the first investment fund in the world dating from 1774, are all part of Dutch financial history.

In later centuries as well, Dutch banks showed an unbelievable capacity for innovation, for example with the establishment of the Hollandsche Sociëteit van Levensverzekeringen (life assurance company) in 1807, and with the 'Tikkerdienst', which was the basis of a rapid system for publishing share prices dating from 1931. For years now payment transaction systems of the Netherlands have been some of the most efficient and innovative in the world. For example, the Dutch banks developed the iDEAL inter-banking payment system which was unheard of when it started in 2005. Dutch banks also led the way as regards providing Internet banking and mobile banking services. In short: banks have, over the centuries, been the financial innovators of their time and FinTech companies avant la lettre. These days, a bank is, in essence, a huge IT company: "Banking is just bits and bytes," according to John Reed (CEO and chairman of Citigroup).[5] Among other things this means that banking products and services can be offered digitally in a simple way and can become commodities or exchangeable relatively quickly. The consequence is that banks, as a sector, spend the most on IT (486 billion dollars per year), which is more, for example, than the telecom sector (427 billion dollars per year).[6]

[4] In *'Kapitaal Nederland'* its authors Frits Beutick and Cherelt Kroeze describe hundreds of curious key moments. The resulting innovations laid the foundation for modern financial systems all over the world.

[5] John Reed, CEO and Chairman of Citigroup (and its legal predecessors) from 1984 up and until 1998 and later chairman of the New York Stock Exchange.
[6] Gartner, *'IT spending worldwide by vertical industry in 2014 and 2015'*

Something that has not changed over the centuries is the need for entrepreneurship at banks. After all, banking continues to be, just as in business as a whole, a question of taking calculated risks, even at that time in which the emphasis primarily appears to be on controlling and avoiding risks. The current climate is characterised by new, potentially disruptive technologies and players that can undermine the banking sector. Banks will have to use all their entrepreneurial skills to remain relevant to all the interested parties, meaning primarily their clients. Clients need this innovation: they want more digitisation, more convenience, more transparency and lower prices. This requires innovation, risks having to be taken and experiments having to be carried out.

In addition, the *regulator* is also calling for this and, in a number of cases, new regulations and guidelines are explicitly intended to promote innovation and competition and reduce the cost price.

In order to respond properly to these developments, Dutch banks will once again have to become innovative in an old-fashioned way. After all, this is something that is not only desired, but also essential!
In the following paragraph we outline today's Dutch banking landscape and the vision of The Dutch Central Bank [De Nederlandsche Bank] (DNB), of the banking sector, and banking innovation in the Netherlands.

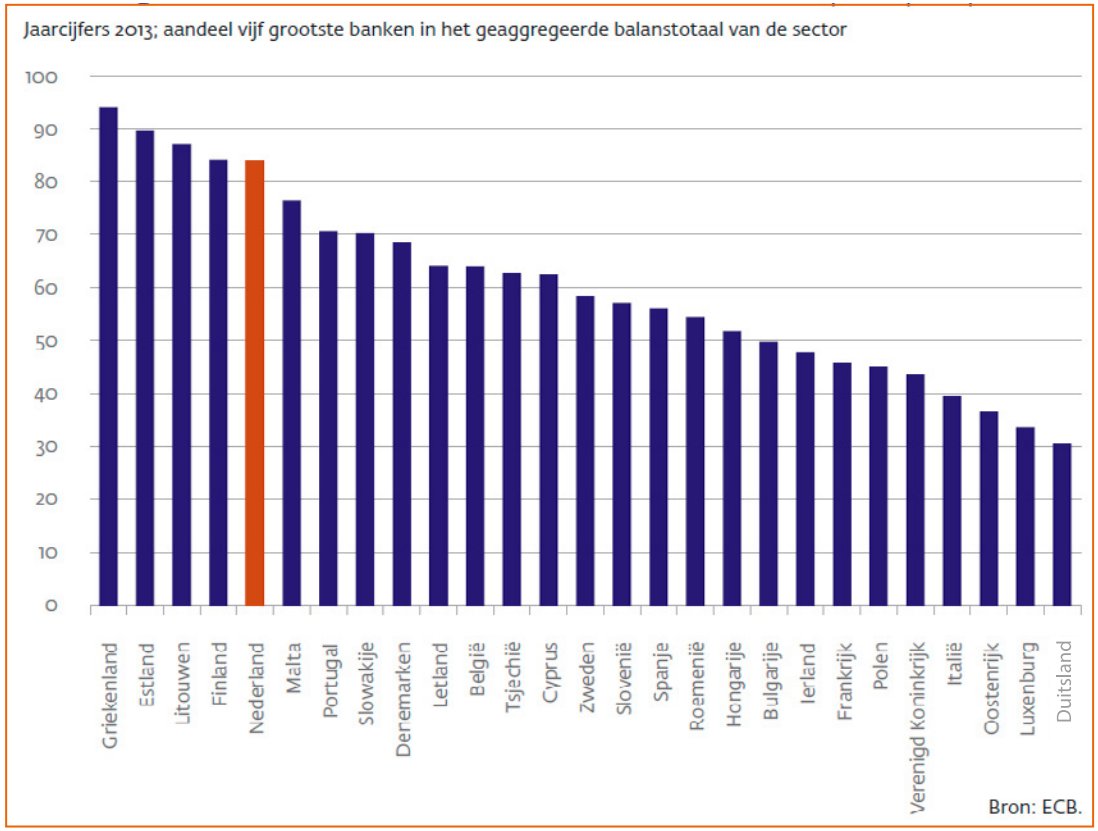
1.1. Reflections on the Dutch banking sector

1.1.1. Characteristics of the Dutch banking sector

The Dutch banking sector is characterised by a number of features, which distinguish itself to varying degrees from similar sectors in other European countries. The Dutch banking sector:

- is concentrated: the five largest banks together have a market share of approximately 85%, the largest three banks together have a market share of more than 70%. The market share of the three largest banks amounts to 74.0% for mortgages, 61.4% for corporate bonds and 80.0% for deposits.[7]
- is relatively large compared to our economy. An analysis of the historical total assets (of 1998 – 2013) reveals that, with total assets of more than 4x the gross national product (GNP), the Dutch banking sector has, for some considerable time, been scoring above the European average of over 3x GNP. The Netherlands is therefore close to the scores of the United Kingdom and Ireland, but with some distance to Luxembourg (more than 18x GNP);[8]

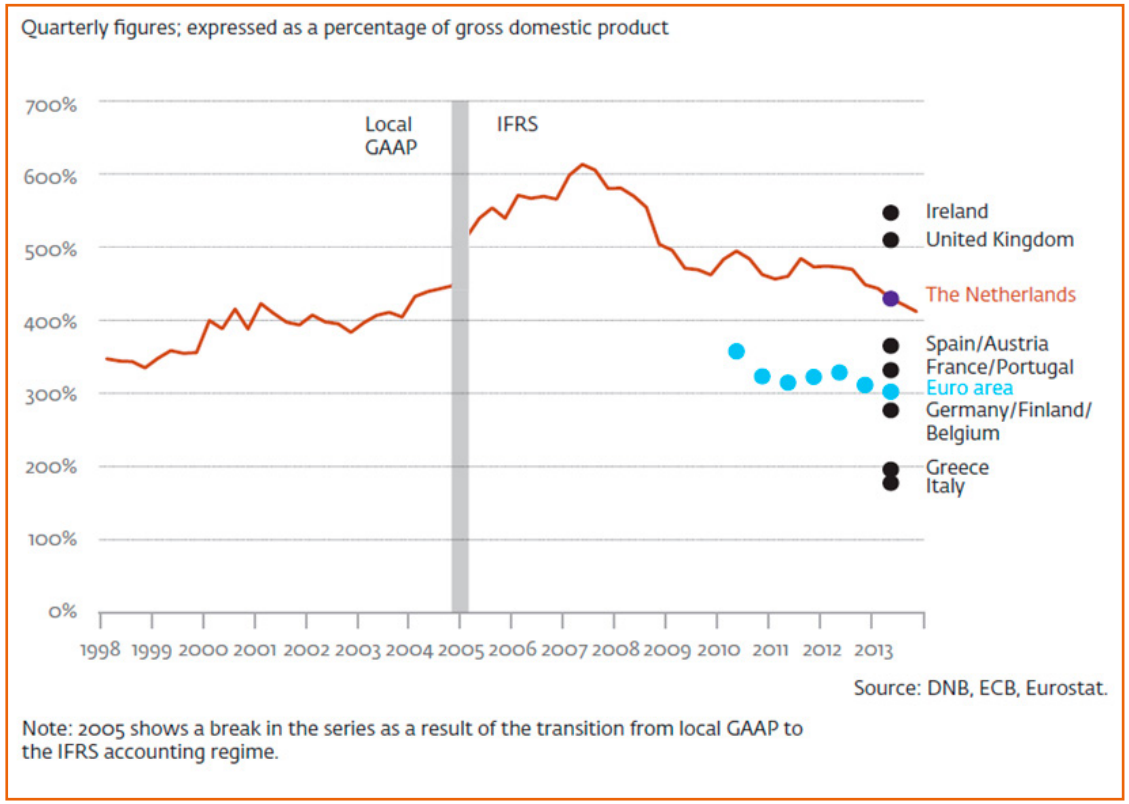
Illustration 1 - Concentration of the Dutch banking sector from a European perspective



[7] *'Visie op de structuur van de Nederlandse bankensector; Stabiliteit en efficiëntie door diversiteit en concurrentie'* (Vision of the structure of the Dutch banking sector; Stability and efficiency through diversity and competition) DNB, 2015.
[8] ECFIN Country Focus, *Luxembourg's financial centre and its deposits*, Volume 10, Issue 9, December 2013.

- is dominated by so-called 'universal' banks with a primary focus on the Dutch market; international diversification is therefore limited;
- is relatively sensitive to fluctuations on the mortgage market. This is also caused by the fact that Dutch mortgages can be financed at 103% of the property value, as well as by fiscal incentives and the relative size of the mortgage portfolios on banks' balance sheets;
- has a large *retail funding gap*[9]. This is also due to the Dutch pension system, to which pension funds have committed a large portion of their private capital. Pension funds in other countries are partially/largely managed by banks.

Illustration 2 - Total assets of the Dutch banking sector from a historical and international perspective



[9] In the Netherlands a significant portion of our savings is put into pension funds. The savings which Dutch citizens have with the bank are therefore insufficient to partly finance outstanding loans. The consequence is a funding gap.

1.1.2. DNB's vision of the Dutch banking sector

In 2015 DNB made its views on the size and composition of the sector clear in its vision[10] of the structure of the Dutch banking sector. In this vision DNB argues in favour of greater diversity and competition in the banking sector. It also suggests that the sector is too large compared to the GNP. DNB is also an advocate of a lower market concentration in favour of smaller parties and new players. The picture that could arise from this is that the Dutch banks are not allowed to grow and that the sector has to decrease in size. This would conflict with the following developments:

- the movement towards one single European banking market, as stimulated by European regulations, the introduction of the Single European Payments Area (SEPA) and the Payment Account Directive, the creation of a European Banking Union and the Capital Markets Union (CMU), which would increase the size of the playing field for banks;
- the commoditisation of banking products and the related need for the creation of scale, the lowering of costs and the availability of sufficient diversification. A lack of scalability is currently causing problems, particularly in the field of payment transactions.

According to DNB the expansion of banks ought to focus on achieving scale and synergy benefits and less on diversification. In the case of (geographical) diversification DNB indicates that it is primarily concerned about the possible moral hazard, because it assumes that a large geographical diversification will be accompanied by higher leverage. This implies that international diversification is possible as long as it does not result in greater leverage.

[10] *DNB Vision of the structure of the Dutch banking sector:* http://www.dnb.nl/binaries/DNB-report%20Visie%20op%20de%20structuur%20van%20de%20Nederlandse%20bankensector_tcm46-323322.pdf

1.1.3. Banking innovation in the Netherlands

In the past, Dutch banks led the way in adopting and encouraging innovations in comparison to foreign banks. This is particularly obvious in the field of payment transactions where the banks successfully launched the iDEAL online payment method onto the market and were pioneers in the phasing out of 'old-fashioned' payment methods such as cheques and the 'chipknip' electronic cash system. International research has revealed that marketplace lending (for the time being?) is primarily successful in the United Kingdom and the United States.[11] In the Netherlands, market-place lending is not yet large-scale (128 million euros).[12] The Netherlands is an attractive place to locate a business for FinTech parties due to the available infrastructure, the international orientation, the presence of peers and Dutch people's language skills.[13] Funding appears to be the largest challenge, which Dutch FinTech start-ups face, although the proximity of large FinTech centres like London is helping to attract investors to the Netherlands. Other barriers for innovation are the current legislation and regulations, as well as the limited international cooperation between start-ups, banks and government institutions.[14]

Examples showing that the Dutch banking sector is an innovative leader:

Financial centre: in a study by the Qatar Financial Centre and Z/Yen[15] Amsterdam as a financial centre is designated as one of the eleven Global Leaders together with, among others, New York, Hong Kong, London and Frankfurt. However, Amsterdam is not in the top 15 cities that are expected to increase in importance in the coming two years.

FinTech investments: in the Netherlands a number of relatively large investment rounds and company takeovers are taking place, involving a total deal volume of 306 million dollars in 2014. In this context, the Netherlands was third behind England and Ireland (jointly 623 million dollars) and the Scandinavian countries (jointly 345 million dollars)[16]. It also needs to be pointed out at this juncture that the 2014 figures are strongly influenced by a large investment round by Adyen which generated 213 million euros.[17]

Mobile banking: Dutch consumers are making use of mobile banking more and more, and are leading the way compared to the rest of the world. In recent years the degree of penetration of mobile banking has risen by 58% (in 2015) to 63% (in 2016), with a further 9% indicating that they are going to start using mobile payments in the coming year.[18]

Sector-wide initiatives: Various initiatives have taken place in the Dutch banking sector which demonstrate that a great deal is being invested in FinTech, for example the appointment of a FinTech ambassador (Willem Vermeend), the existence of innovation *accelerators* such as Holland FinTech and Startupbootcamp, and initiatives by umbrella organisations such as permanent education points for the supervisory board in the Code Banks, FinTech meetings (INSEIT, WEF, DNB, AFM, NVB). There are also other initiatives taking place between banks, like in the field of iDIN (controlled by the Dutch Payments Association [Betaalvereniging Nederland]) and *instant payments*.

[11] *Moving Mainstream, The European Alternative Finance Benchmarking Report,* February 2015, University of Cambridge.
[12] Douw&Koren, Crowdfunding in the Netherlands 2015. *according to Crowdfundmarkt, equity based crowdfunding counts for €6,9 million,
[13] PwC, *Blurred lines: How FinTech is shaping Financial Services*
[14] Roland Berger and Holland FinTech, *'Barriers to FinTech Innovation'*

[15] *The Global Financial Centres Index 18,* September 2015
[16] Accenture, *The Future of FinTech and Banking*
[17] Adyen, press release: *Adyen Raises $250 Million in Funding to Accelerate Growth of Its Global Payments Platform,* (16 December 2014)

[18] Mobile Banking 2016: World on the move for mobile banking, July 2016

With regards to the impact of technological innovation, DNB issued a report in January 2016[19] in which it expresses the intention to adopt a more open attitude towards innovative solutions, new technologies, and new players. The regulator indicated that it regards the development of FinTech to be important. DNB intends on opening a digital and physical portal for FinTech parties and banks to provide a guideline for supervision policy and, for example, for licence applications, changes to licensing and supervision policy, and to open a so-called regulatory sandbox in which parties can experiment with DNB.

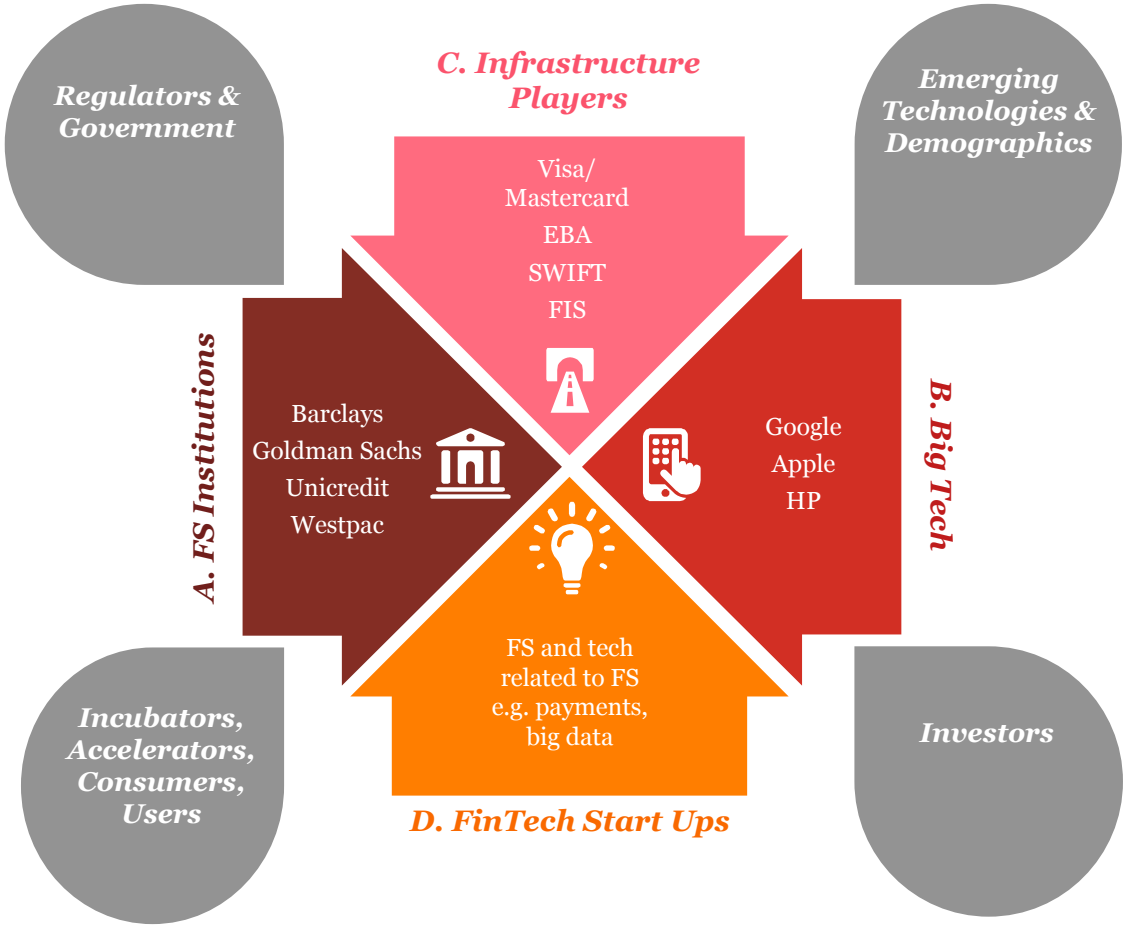
In light of the important contribution which the banking sector has made in the past to our country's prosperity (as described in section 2) and the size of the sector compared to GNP, it is worth mentioning that the financial sector is included in the so-called top sectors policy of the Ministry of Economic Affairs.

[19] *Technological innovation and the Dutch financial sector: Opportunities and risks for established institutions, newcomers & supervisory bodies',* DNB, January 2016

1.2. Scope

Banks operate in a FinTech playing field where they have to deal with unknown competition. FinTech start-ups (and also BigTechs, see also illustration 4) are leaders in the use of new digital technology, are extremely innovative and even disruptive, are quick and agile and are attracting larger and larger investments. These days there is a FinTech alternative for almost every product and service provided by traditional banks. New FinTechs have forced their way into the banks' value chain with non-banks conquering the world of banking and forcing banks to adapt their business model. The emergence of successful FinTechs for almost every bank service is unavoidably accompanied by a loss in market share and profitability for the traditional banks. At the same time it is no longer the case that established banks and FinTech parties only compete with each other. These days, there is more and more talk about a development towards a new 'FinTech ecosystem' in which traditional banks, established banking service providers, and FinTech start-ups are working together and are competing with each other to develop and offer innovative banking products and services. Banks are - in-house and remotely - setting up their own FinTech start-ups, are investing in, or acquiring, existing FinTechs, are integrating FinTech products into their own services and are, for example, participating in blockchain consortia.

Illustration 3 - FinTech playing field



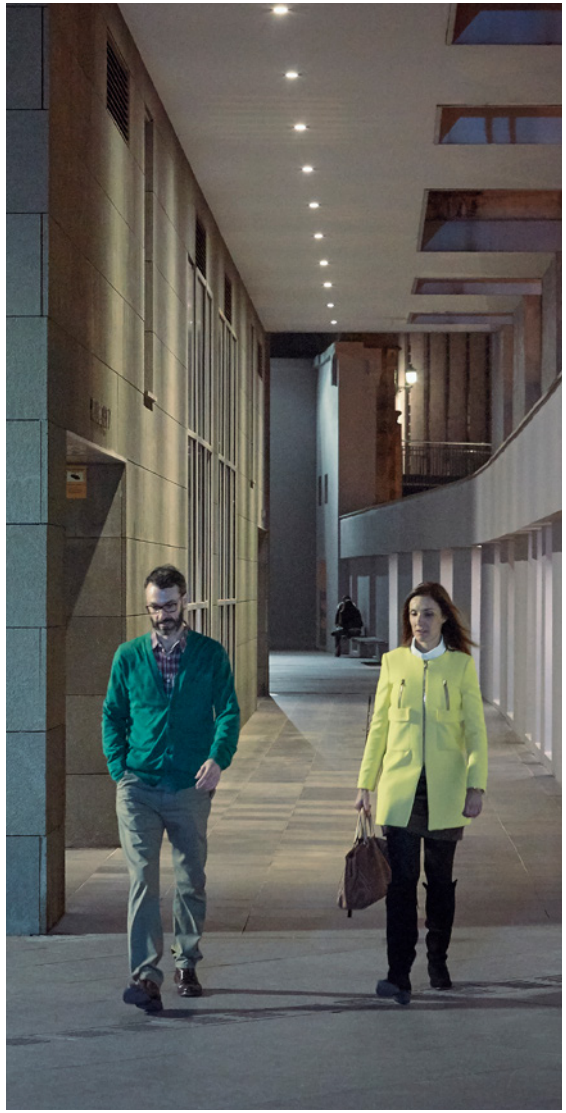
In the remainder of this report we describe the dynamism of this FinTech-ecosystem: the development of new, potentially disruptive technologies, changes in the behaviour and preferences of consumers (that are partially driven by new technology), and the influence of new players on a number of the most important banking products, services and processes. We also describe which strategic themes banks should focus on in order to strengthen their position in this ecosystem and by doing so retain their relevance as a financial service provider. With this in mind, we suggest a number of initiatives which banks can take both individually and collectively. In writing this report we base ourselves largely on our observations of the market both in the Netherlands and outside and we illustrate the developments using a large number of examples from both the Netherlands and abroad.[20]

Illustration 4 - FinTech, BigTech and RegTech

FinTechs are non-banking players that are able to supply comparable products and services, often at lower costs by using, above all, state-of-the-art IT, scalability, and legislation and regulations which gives them an advantage on a number of points, compared to established banks. FinTechs generally focus on specific elements of the value chain.

BigTechs, such as Google, Facebook and Amazon, are major technology companies that focus primarily on the end user and have the option of creating 'bundles' for them. They have a huge client base, for whom switching costs are high, due to the excellent (and often free) products and services. BigTechs focus on specific elements of the banking value chain, alongside their existing services, but also have the capacity to absorb that value chain in its entirety.

RegTechs are FinTech or BigTech companies that use tooling to comply with legislation and regulations. (BigTech and RegTech are specific types of FinTech and when we refer in this report to FinTech, we usually mean BigTech and RegTech companies as well).



[20] Throughout the document we use a lot of examples (in the boxes and elsewhere) to clarify the text and to make the report more appealing. These examples come from public sources. PwC has not thoroughly researched this any further and the examples therefore do not, in any way, represent a definitive summary of *good practices*.

A report with these objectives requires careful definitions and, with this in mind, the following choices were made:

Technology/FinTech: The development and influence of FinTech are central themes in this document. Other trends such as social, demographic, increasingly scarce raw materials, climate changes and the like are receiving no, or less, attention, despite them very possibly being relevant for the banking sector.

Geography: The focus is first and foremost on the consequences for the Dutch banking landscape. However, in view of the international nature of the relevant developments (technological innovation, the shift of legislation, regulation and supervision, the origin of new players and competitors) we, of course, also look beyond our national borders, as the landscape is also becoming international. What applies to the Dutch banks will also apply, in general, to small to medium-sized banks in other countries which engage in limited international activities.

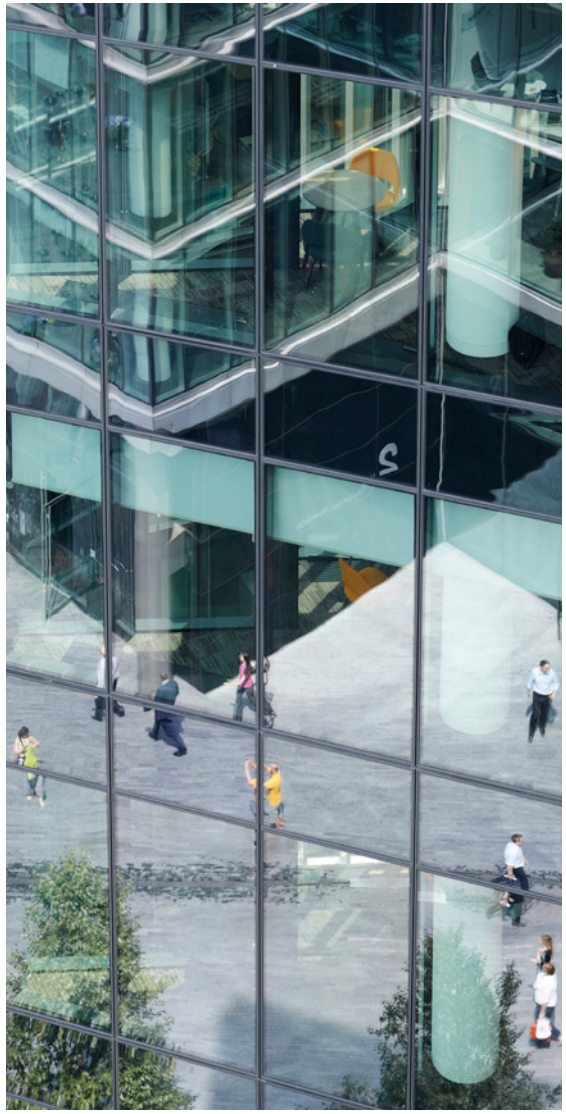
Time: This report describes, in particular, current developments and the possible consequences thereof and is not intended to be a description of what the banking sector will look like in the long term. Having said that, recommendations are being made to banks regarding themes which they can individually and jointly explore in order to stay relevant in the future and retain their position.

Products: We limit ourselves primarily to a bank's core activities: payments, savings, investing and loans (including mortgages).

Segments: The main focus in this report is on the banking retail segment, because the number of initiatives and the impact of FinTech is greatest there. If applicable, other client segments served by banks are also explored.

Relationship with other initiatives in the field of FinTech: In this report we focus primarily on recommendations for initiatives which banks can take jointly or as a sector in order to promote innovation and the use of new technology. In addition each bank has, of course, the option of taking initiatives individually in this field.

Comments: In this report we discuss the banking sector and generic trends and developments that take place therein. This may mean that some individual banks will not recognise a term or classification. We have opted only to talk about a generic trend if this occurs in the case of at least two banks from the top 4 and/or if the banks have explicitly mentioned this in public.



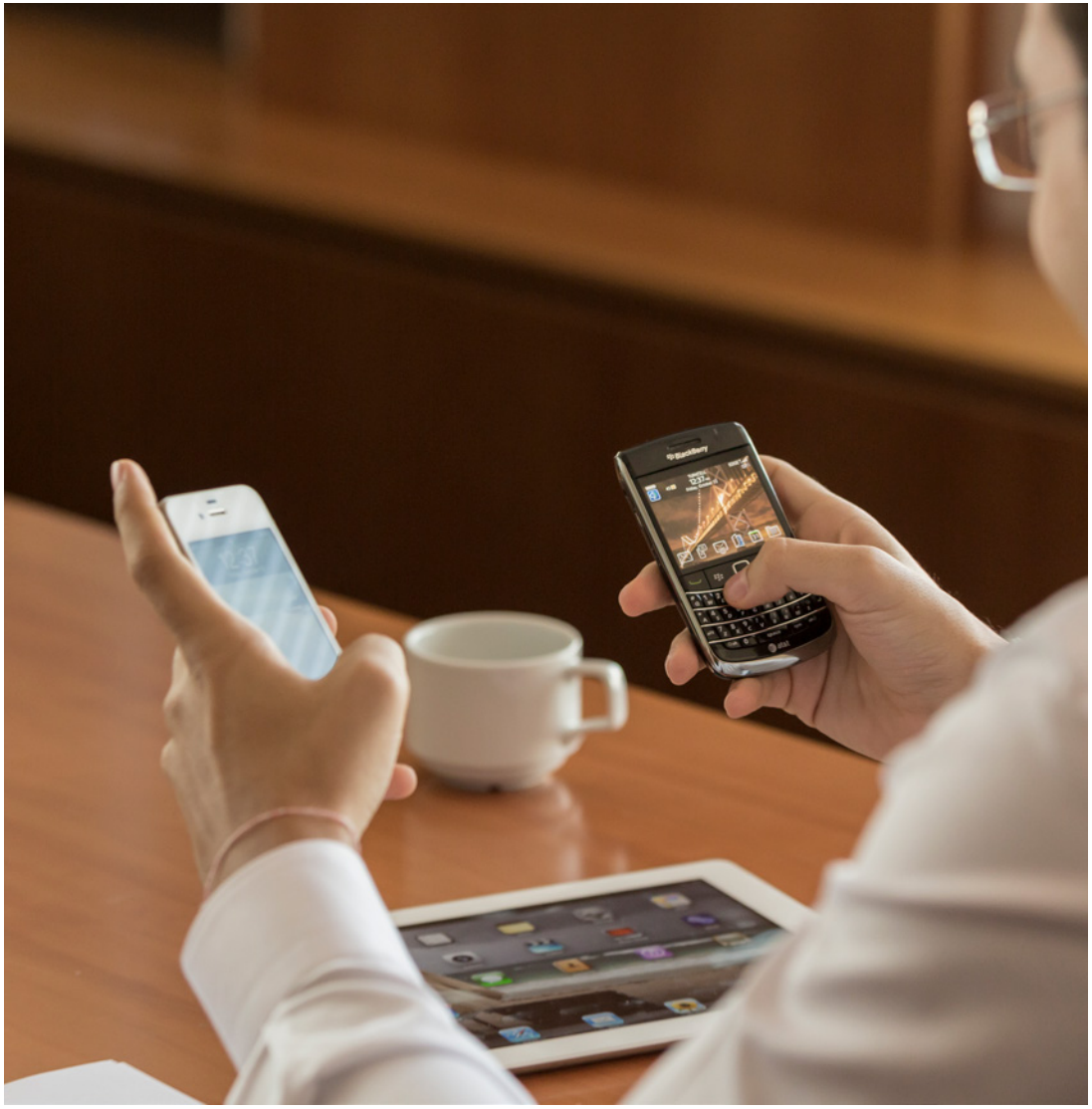
1.3. Overview of this publication

This section is followed by section 2 in which we describe a number of developments which are causing change in the banking sector: in the first place this means technological developments and then legislation and regulations, the changing client demand and new players such as FinTech companies in particular.

This description is an introduction to three strategic themes which are explored in more detail in section 3. These themes of trust, convenience and low costs are combined in the relevance formula, which is the recipe that banks and other market players can use to keep up with current and future developments and maintain or strengthen their position in the market.

This report concludes with section 4[21] which refers to the options available to banks collectively, as well as with other market parties, in order to strengthen both the banking sector as a whole and their own relevance therein.The last section contains a final word on our vision of how banks, in conjunction with FinTech or otherwise, respond to the developments described.

[21] The referred to section 4 has not yet been added to this version of this report. The selection of the joint initiatives of existing banks is currently still in the coordination phase.



2. Developments impacting the banking sector

In essence, banking means maintaining a balance between three components: risk, return, and funding (capital and liquidity). In the run-up to the financial crisis, the balance changed to achieving the highest possible return, primarily due to pressure from shareholders. During the crisis and immediately afterwards, the emphasis was clearly on avoiding and managing the risks, as a consequence of the response by supervisory authorities, politicians and society to the crisis. At the time of the Asset Quality Review (AQR) by the European Central Bank (ECB), the focus was primarily on establishing the sufficiency of banks' capital. Now the focus has switched back to the return, and primarily to the sustainability of the business model. These days banks are well aware that it is of vital importance to them to achieve a healthy return using the available funding based on a sustainable business model that assumes acceptable risks. Supervisory authorities are also focusing more on the sustainability of the banks' business model. The ECB recently indicated that, within the framework of the Supervisory Review and Evaluation Process (SREP), it was going to implement a Business Model Assessment (BMA). The BMA consists of a detailed analysis of the banks' business models with a view to establishing their viability, the sustainability and associated risks.[22] *Healthy banks are essential for a stable financial system. There is a growing realisation that banks have to take calculated risks in order to stay healthy, rather than avoiding them.*

[22] The Supervisory Review and Evaluation Process (SREP), the second of the three pillars of the Basel Supervisory Standard, consists of four key elements: the business model analysis, the analysis of the *governance* and audits, and the solvency and liquidity of a bank.

The sustainability of the banks' business models, and therefore also their future health and stability of the financial system, are not things that can be taken for granted. Banks are facing numerous, sometimes disruptive, challenges which are primarily the result of changes in legislation and regulations, and technological developments which are causing both client demand to change and are encouraging new competition. New legislation and regulations are not only imposing stricter capital and liquidity requirements on banks, but are also aimed at stimulating transparency, user convenience, lower costs, innovation and the creation of more competition. The latter consists primarily of FinTech or BigTech players, which are frequently subject to a more lenient supervisory regime. On the other hand, the regulation and supervision of banks is actually becoming more intensive: greater interference with primary processes, more *rule-based* and data-driven.

In short, the banking sector is going through rough times. The Millennial Disruption Index[23] even says that there is no other sector in the United States that is affected as much by technological developments as the banking sector. The report by the World Economic Forum on the future of the financial sector concludes that banks will be the first in the financial industry to experience the consequences of all the disruptive changes.[24]

This section describes the factors which we, in view of the scope of technology and FinTech, consider to be the most relevant for the banking sector: the changed client demand, technology, FinTech and substitute products, legislation and regulations, and the business model.

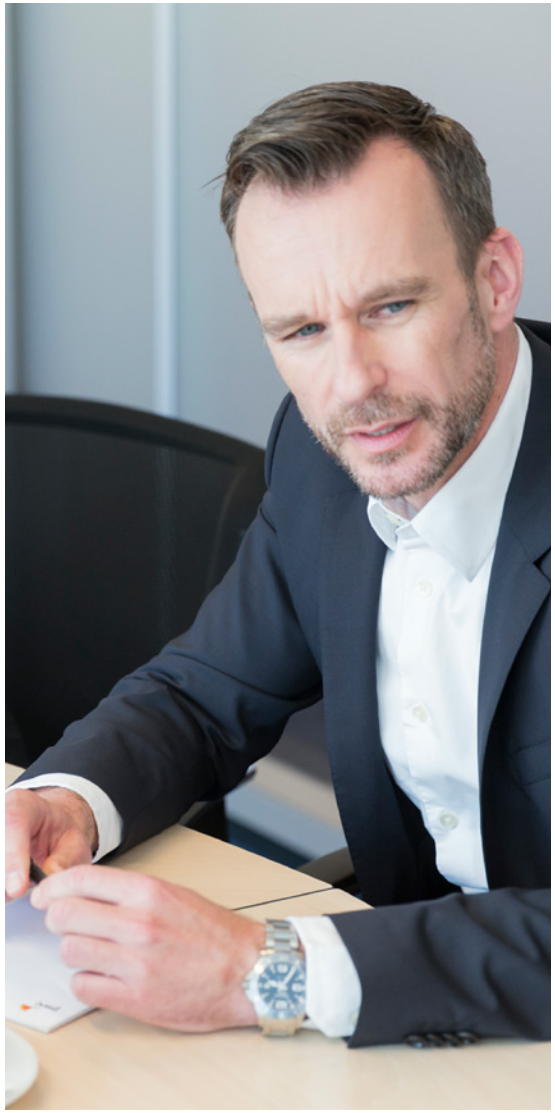
[23] Viacom Media Networks, *The Millennial Disruption Index*
[24] World Economic Forum, The Future of Financial Services. Full quote: *"The most imminent effects of disruption will be felt in the banking sector; however, the greatest impact of disruption is likely to be felt in the insurance sector."*

2.1. Change in client demand and the creation of the 'super consumer'

The expectations which clients have of companies, brands, products, services and experiences are changing at lightning speed, primarily as a consequence of digitisation. Those expectations are being linked more and more to outcomes which improve clients' lives or specific situations and are seen as a result of emotional and social needs and less of product-driven, functional solutions. This has led to the creation of so-called super consumers, which relate to a growing group of bank clients who are continually imposing new and higher demands on services and user experiences and who are also less loyal to companies and brands and other client groups. Super consumers are characterised in the following ways:

Super consumers trust their peers. A great deal of research into brands has shown that true brand loyalty has significantly decreased. The choice for a certain brand is no longer based on brand loyalty but by personal recommendations, via social media or otherwise. It is then a mistake to believe that current consumer inertia as regards switching to a different bank is the result of brand loyalty. When creating a loyal group of clients, banks can make a great deal more use of ambassador models whereby clients inform each other (and trust each other), alongside 'traditional' client satisfaction studies.

Super consumers expect more. The expectations which clients have of their bank are partly formed by experiences outside the financial sector, where both the content and functionality of products and services and interactions with providers are much richer and more appealing. Fed by these experiences clients expect from banks that they provide easy, trouble-free and safe access to banking services at all times and in all places. However, this does not mean that banks can apply best practices from other sectors directly to their own services. For example, banks have to be careful about using online marketing techniques common in the retail sector, where principles of influence such as nudges and triggers are used to stimulate digital sales. Numerous banking products and services are, after all, low interest, and the use of these principles of influence is a lot more difficult and can quickly be interpreted as an excessively intrusive approach which is not focused on client interest. The challenge banks face is to anticipate the increasing expectations of their clients with regards to a personalised user experience based primarily on convenience, after which to ensure that the way they provide their services fulfils those expectations.



Crowd servicing as used by Fidor Bank (see box) is a good example of a way in which banks can bind clients to them by using their peers. Crowd servicing first and foremost creates ambassadors for the bank and a group of clients who feel more involved with the bank and with their community of fellow clients. This increases client loyalty and retention. In the long term, significant cost savings can be achieved through crowd servicing. The use of *crowd servicing* can cause the costs of customer service to drop to only 9% of the costs of a traditional call centre and are therefore lower than the costs involved in using a chat service or self service (decreases up to 56% and 11% of the call centre costs respectively).[25] In the telecom sector T-Mobile claims that more than 60% of the questions normally dealt with by customer service are now resolved by the community.[26]

Illustration 5 - Increasing client loyalty through recommendations on social media

#bankingwithfriends: banking with the community

Fidor Bank AG is one of the first banks to have a focus on peer-to-peer banking. This bank assumes that social or peer-to-peer banking can be a 'unique selling point' which ensures higher client loyalty and attracts more 'digitally-literate' clients.

Fidor currently has almost 310,000 members to whom it offers various products and services on the basis of personal (behavioural) characteristics. This not only refers to cash incentives which are linked to so-called Karma scores issued by Fidor, but also to a connection with and engagement in the community. In fact, Fidor gives clients the possibility to express their views on how the bank should be run, to influence the interest rate or the name of a new debit card. .

The influence on the interest rate is determined on the basis of the number of likes on Facebook. For every 2,000 likes, the interest rate is raised by 0.1% to an upper limit of 0.5%. In addition to its 'banking with the community' Fidor has also won many prizes and acquired an international reputation with its '60 second onboarding process' for new clients, by opening its platform to third parties, and thanks to its crowd-funding and peer-to-peer lending propositions.

Profile of Fidor Bank

Annual turnover in 2015: € 27 million
Country in which headquarters are located: Germany
Ownership: Private
Year of establishment: 2007
#Employees: 90

[25] McKinsey, *Higher satisfaction at lower costs: digitizing customer care*
[26] *A blog post* in which Marieke Snoep & Arianne Heij are interviewed about T-Mobile's Crowdservice Community, 18 September 2014

Super consumers are better informed.

Due to their access to the Internet and online social networks, consumers are able to become better informed by carrying out research themselves and through recommendations by others, as well as through specific advertising which influences consumer choices.

Clients' easy access to comparison sites, studies and data means it is necessary for banks to be transparent and honest when communicating about their products and services. When it comes to informing clients, aggregators can play a particularly useful role by compiling a complete overview of their finances (as a result of which a client does not have to consult the various websites of numerous banks). Aggregators also give clients an insight into the issue of whether better deals are available from other providers for certain financial products.

Illustration 6 - Aggregators help to inform consumers

Aggregators: disrupter of the client relationship?

Aggregators (in the financial sector) are companies which generally do not provide banking services, but which bring together (aggregate) services from various banks to form an overview for consumers and also enrich the data with analyses. The expectation is that banks will increasingly start adopting this aggregator role and will therefore not only supply the primary product but also fulfil the aggregation function.

How does it work?

Bank X offers clients a savings interest rate of 1.6%. One of the functionalities of an aggregator can be that it informs the client that bank Y is offering a savings interest rate of 1.9%, and it can provide specifications of the terms and conditions. In this way, aggregators can offer more transparency to clients (functional role) and implement part of the duty of care more effectively than banks (social role). One condition is that the insights have to come from reliable, accurate, and complete datasets and algorithms.

There are various types of aggregators which aggregate various sorts of data, functionalities or services for clients, partners or other interested parties. While some aggregators focus primarily on the technology, others focus more on the front-end design and the user-friendliness.

- One example from the Netherlands is The Moneyer, which offers users a free financial insight and overview by, among other things, integrating personal financial accounts and depicting future simulations.
- SmartCredit collects the consumer data from various parties and presents it in an overview. SmartCredit also reports the credit score and offers services to reduce credit scores or to initiate negotiations about existing loans.
- Mint (US) makes switching-related recommendations which help users to reduce costs.
- The ambition of Rubique (India) is to become the largest online marketplace for financial products in India and takes its inspiration from successful peers such as Flipkart and Snapdeal.

These examples show that aggregators have assumed an important role in offering clients a total overview of their financial position as well as better alternatives for existing financial products.

Super consumers have options. A lot of banking products have become commodity products which are easy to compare. Interchangeable products and services, limited brand loyalty and easy access to comparison sites mean it is essential for banks to make an extra effort in order to retain clients. However, for the time being, consumers are suffering from serious inertia when it comes to switching to a different bank. One example of this can be found in the market for current accounts: 73% of the current account holders aged over 18 years have not yet switched and 24% have only done so once. The ACM has hypothesised that obstacles to switching in the form of perceived 'hassle' are the reasons for this inertia*[27]*, although this did not turn out to be the case. Politicians and supervisory authorities are now calling for the obstacles to switching to be lowered and for client inertia to be reduced. This may be possible thanks to the emergence of number portability, improved switching services and the broader use of so-called aliases by the banks themselves (such as a link between the current account and the holder's mobile telephone number or email address).

Illustration 7 - Apps which facilitate peer-to-peer payments

More options when it comes to paying?
There are various mobile apps on the market which can be used to make peer-to-peer payments. The advantages of these apps are often convenience and speed, the use of aliases, and greater freedom of choice for consumers as regards to making payments. A disadvantage of these apps is often still that they only work if they are also used by the person receiving the payment. This can be a major obstacle to them becoming more popular among clients.

Dutch providers of peer-to-peer payments include Bunq, Twyp (ING), Sjaak (SNS), Tikkie (ABN AMRO) and Knab. These companies' apps are in many cases free and enable payments to be made using an alias such as a telephone number or an account on social media.

Examples from abroad are Barclays' Pingit (UK), PayPal's Venmo (US), Paym (UK), Square Cash (US), Swish (Sweden), Nooch (US). Pingit, which has been around since 2012, is expanding its services significantly. Since February 2015 it has been possible to make payments with Pingit via Twitter, and in July 2015 Pingit entered into a collaboration with Zapp (a mobile payment service), as a result of which users can use their mobile telephone to pay in stores and for certain purchases on the Internet. A lot of comparable initiatives are now also available on social networks, with peer-to-peer payments being possible via Facebook Messenger, Snapcash (in a partnership with Square, an American payment service) and WeChat (Chinese messaging service).

Swish is a peer-to-peer payment app used by six Scandinavian banks (Danske Bank, Handels-banken & ICA Bank, Länsförsäkringar, Nordea, SEB, and Swedbank) for private and commercial clients. New clients can register for Swish via one of the affiliated banks, after which the Swish app, in combination with BankID, can be downloaded and used.

[27] ACM market research, June 2014

Super consumers have the option of expressing their opinion in public. Online platforms such as Facebook and Twitter offer consumers enormous range, to publish their experiences - good and bad - with companies and brands. Clients are not afraid of using these platforms to voice their undiluted opinion, and social networks, product fora and other public websites are often their preferred channels. Twitter and Facebook are filled with complaints or other comments on the events which can be shared with others at the push of a button.

The new *super consumer* that has been fuelled by these descriptions is, incidentally, not a client that only wants digital services. PwC recently conducted a study among 400 British clients with varying levels of income to assess their preferred advice model for investments. This revealed that only 23% want to be served purely by a robo advice model, while 32% prefer face-to-face services and no fewer than 45% want a hybrid advice model (digital and face-to-face).[28]

[28] PwC customer research in Q2 2016, 'Preferred advice model for middle income (investable assets, £50k) and mass affluent (investable assets, £50-100k) when investing for a life goal'.

2.2. Technological developments are potentially disruptive

In recent years, the financial sector has undergone drastic changes which generally contained a significant technology component. On the one hand a lot of the changes in client demand are driven by technological developments, for example mobile banking. On the other hand legal and organisational changes that have confronted banks often have a major impact on their technological infrastructure. Examples are new compliance requirements or the restructuring of banks through the sale or purchase of business units and portfolios.

These developments are posing a new dilemma for many established banks. On the one hand they are forced to maintain their often outdated legacy systems and, on the other hand, they have to innovate and invest fully in new technology in order to respond effectively to all the changes. Seen like this, the legacy of IT infrastructure which established banks carry with them is one of the largest barriers to innovation and also a burden which also places banks at a disadvantage compared to new players who do not have that baggage.

Clayton Christensen, Professor at the Harvard Business School, describes two types of technologies in his book '*The innovators dilemma*'[29]: *sustainable* technologies which improve the performance of products and processes, and disruptive technologies which can change the entire industry through the introduction of often simpler and more effective products. An example of disruptive innovation is the digital camera which, at first, produced photos of a much poorer quality than analogue cameras. But the digital camera was able to fulfil the consumer's wish of quickly and easily making pictures and only printing the desired copies. Over time, the quality of digital cameras improved so much that this entire photographic industry had been disrupted.

In this section we describe eight possible disruptive technologies which may force banks to make significant changes to and investments in their IT infrastructure.

[29] C. Christensen, The Innovator's Dilemma: The Revolutionary Book That Will Change the Way You Do Business. New York, Harper Business, 2013.

2.2.1. Advanced analytics

The term *advanced analytics* refers to techniques used to predict outcomes and find new correlations on the basis of large datasets, or big data. Advanced analytics has the potential to transform consumers' bank experience. These techniques are primarily used to improve convenience and trust, which are connected to the relevance formula.

Banks can use advanced analytics internally in the context of, for example, the risk management of portfolios and for marketing purposes such as reputation management and monitoring product launches. In order to facilitate this type of use, banks generally work with a data lake, which is a central place where all relevant data is gathered, from both internal and external sources and in both rough and derived form. The data in the data lake can be accessed and used in various ways, depending on the application of the data.

Web APIs *(Application Programming Interfaces)* as offered by BigTech companies like Google and Twitter facilitate large-scale data consumption and processing. More and more banks are experimenting with APIs, such as Credit Agricole with its CA Store[30] and BBVA with its API Market[31], and these are enabling clients to use new products and services on the basis of the available data. The Turkish GarantiBank has developed an application for retail clients which generates more and new insights based on their own data and that of other users.

[30] *Credit Agricole App Store*
[31] *BBVA API_Market*

Illustration 8 - Profile of GarantiBank, personal offers via the mobile app

GarantiBank offers a free mobile app (iGaranti) which provides clients with personalised offers and advice based on their location and their past expenditure. To do this, the app uses big data and advanced analytics and based on, among other things, the location details and reviews of Four-square users, it directs users to stores nearby with a special offer. The app also makes it possible to save interesting suggestions and, based on earlier expenditure, it can estimate a client's spending power for the rest of the month.

Profile of iGaranti
Annual turnover in 2015: $8.3 billion
Country in which headquarters are located: Turkey
Ownership: Public
Year of establishment: 1946
#Employees: 19,036

2.2.2. Blockchain

Blockchain is the technology on which the virtual bitcoin currency is based. After the first application of this technology, it gave rise to different types of blockchain, such as Ripple and Ethereum. Blockchain - literally a chain of blocks - is a shared database in which participants can record transactions that are conducted with each other. It is comparable to a shared cash book detailing all the transactions, as opposed to a separate cash book in which everyone keeps his own records. In the latter case a central party is needed to audit the various balances and to make sure that the expenditure and ownership correspond (one of the functions of a bank). Using blockchain technology creates a shared cash book, and there is no longer any need for such a central party, otherwise referred to as the trusted *third party*.

Participants in this database can only add things and never change anything in the past. As a result, transactions are 'set in stone' once they have been carried out. What is more, each participant (node) has his own copy of the database (the entire blockchain) and each participant individually verifies each transaction and each block of data. Thanks to this consensus mechanism it is possible for each participant's version of the blockchain to 'grow' by the same number of blocks whenever new transactions take place.

In this way, blockchain agreements between participants – for example bitcoin transactions – can be carried out without the involvement of a central party. This is precisely blockchain's strength, namely that there is no central institution that determines what 'the truth' is. This truth is recorded in the decentralised database which everybody has a copy of. [32]

Blockchain technology offers the financial sector plenty of benefits, primarily in the form of cost savings. Among other things there are the lower transaction commissions, more efficient back and mid offices, and a faster settlement of international payment and securities transactions (which in turn leads to lower liquidity costs). Besides cost savings, blockchain also reduces risks, because fewer intermediate parties are involved in the transactions, and because there is more data and transaction transparency and security. This is not only relevant for parties that use the blockchain technology but also, for example, for supervisory authorities. In this way blockchain increases trust, as well as taking care of the convenience factor of the relevance formula.

Illustration 9 - Ethereum, the accelerator for the use of blockchain?

Ethereum is a recent example of one of the possible uses of blockchain technology. It is a decentralised platform that facilitates 'smart contracts'. The advantages of this platform are, among other things, that contracts are executed with a high degree of security and without the intervention of third parties. Ethereum is a non-profit organisation that offers solutions such as the Ethereum wallet with which 'Ether' and other 'crypto assets' can be issued, executed and used on Ethereum more rapidly in 'smart contracts'. Ethereum is used by, and collaborates with, parties such as Microsoft, ConsenSys and R3. The latter recently set up an experiment (January 2016) based on Ethereum and Microsoft Azure's 'blockchain-as-a-service' with 11 banks (among others Wells Fargo, Credit Suisse, HSBC and Royal Bank of Scotland) whereby notional value is exchanged (transactions), without a central party.
Sources: ***Consensys***, ***Ethereum***, ***Coindesk***

NB. It became known in June that an unknown hacker had managed to steal tens of millions from The DAO investment fund via Ethereum..

Profile of Ethereum
Annual turnover in 2015: n/a
Country in which headquarters are located: Switzerland
Organisation: Non-profit
Year of establishment: 2014
#Employees: 10-50

[32] ING Investment Office, Sector comment (sequel), Blockchain: beyond the hype

2.2.3. Mobile

When we use the term mobile we refer to the use of a mobile carrier such as a mobile telephone or tablet as a channel for carrying out banking business. The mobile channel is becoming one of the primary channels for Internet banking, online payments and payments in stores. Internet banking is already taking place on a large scale using mobile telephones and tablets, and mCommerce (online payments on a mobile carrier) is undergoing huge growth. At this moment in time, mCommerce is responsible for 35% of the total eCommerce turnover (online shopping on a desktop computer or laptop) in the US. The expectation is that mCommerce will grow four times faster than eCommerce, meaning that this share will increase to 50% in 2020[33].

Despite the fact that from a technical perspective, both consumers (high penetration of smartphones) and the acceptor (most payment terminals are equipped to accept contactless payments) are ready, mobile payments in stores are not yet popular. For the time being, the adoption of mobile payments in stores is limited by two main issues:

1. There are no mobile wallets, digital versions of the traditional wallet, yet which can be used in any location. At this point in time only two banks in the Netherlands have launched a mobile wallet which you can use to make contactless payments using a smartphone. Both are only usable on a limited scale, depending on the consumer's type of smartphone or the mobile telephony provider.

2. Consumers have not yet been sufficiently triggered to use a mobile wallet instead of, for example, a contactless bank card. Where payment transactions have already been efficiently arranged, the benefits for the consumer and the acceptor of switching to new payment methods are only minor.

In order to promote the adoption of mobile wallets, cooperation between the banks themselves is needed in order to achieve further standardisation and remove existing restrictions. Banks will also have to start cooperating with other parties in the ecosystem such as mobile telephony providers, credit card networks, store owners and, for example, public transport companies in order to develop propositions which are of added value both to the consumer and the acceptor. This primarily means services offered in relation to the transaction, such as loyalty programs, location-dependent offers, *line-busters* (collecting products ordered online without having to queue) and personalised offers. These developments indicate that 'mobile' is helping to improve convenience for clients and is also contributing to the relevance formula.

[33] Forrester Research: *US Mobile Phone And Tablet Commerce Forecast*, 2013 To 2018

2.2.4. Artificial Intelligence (AI)

One definition of artificial intelligence is the extent to which a computer is able to display a comparable degree of intelligence as a person. In recent years IBM together with Watson, and Google together with AlphaGo, have made huge advances in this field. BigTechs with AI services, such as Microsoft with Cortana and Amazon with Echo, are developing applications for users which can be integrated with services and functionalities which make consumer lives easier. This technology is a response to the desire to improve convenience, but also helps to increase trust.

Applications at banks vary from digital (that is non-human) advisers - robo advice - to answer client questions on the website, to advanced trading algorithms and fully automated, algorithm-based credit approvals. Although these are initiatives are very promising, many applications based on artificial intelligence still have to prove themselves.

Illustration 10 - Self-service at Atom Bank and Kensho

Atom Bank: Clients serve themselves

The British start-up Atom Bank has an app containing an 'AI bot' to answer client questions. The required technology comes from DWS, a company that provides technical support and related consultancy services to the world's largest telecommunications brands, and which has been a subsidiary of Xerox since 2012. The Atom Bank app analyses the behaviour of users, the problems they submit and the successful solutions for these problems. The longer the app is used, the smarter it becomes. In this way clients can use a self-service option without any employee being required.

Profile of Atom

Acquired capital: $176.2 million
Country in which headquarters are located: United Kingdom
Ownership: Private
Year of establishment: 2014
#Employees: 11-50

Kensho: New insights thanks to artificial intelligence

A good example of the use of artificial intelligence is the service offered by Kensho. Kensho has software (which appears to be very similar to the Siri app used in the iPhone) to which investors can submit complex financial questions which are then answered in a language that can be easily understood. To do this Kensho automatically performs complex and detailed research which used to be done by people. An important point that needs to be made is that Kensho is also able to search through unstructured data to collect more insights from available data sources. The service offered by Kensho fulfils the requirements of today with regards to speed, scalability and automation. News broadcaster CNBC is already using Kensho technology for research and analytical insights in order to place certain developments in the market in a usable, historical context. At the end of 2014, Goldmann Sachs announced that it was going to invest in a partnership with Kensho.

Profile of Kensho

Acquired capital: $57.8 million
Country in which headquarters are located: United States
Ownership: Private
Year of establishment: 2013
#Employees: 51-200

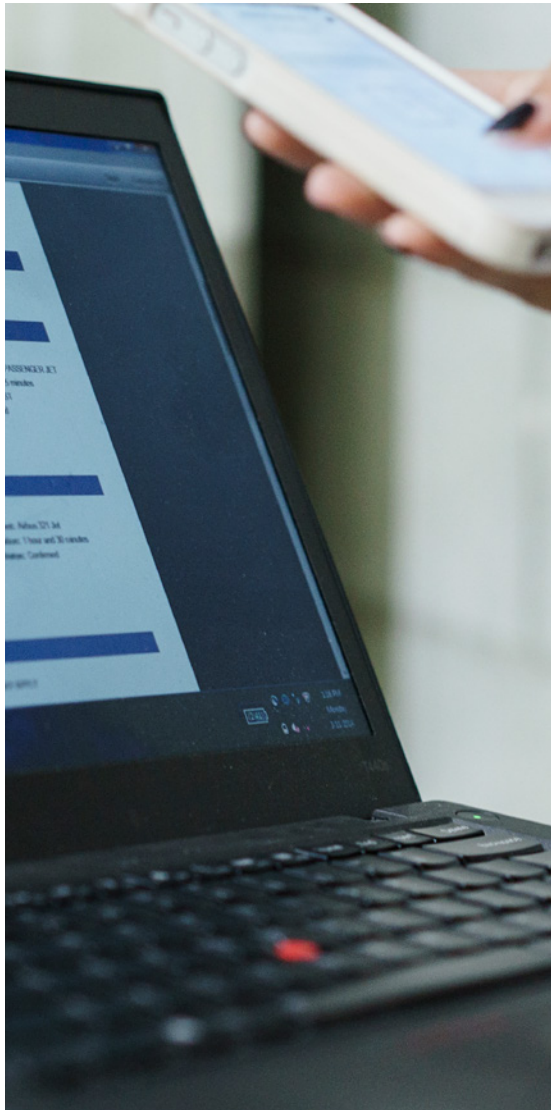
2.2.5. Cloud computing

Cloud computing is an umbrella term for using a network of remote servers linked via the Internet for the storage, editing and processing of software and data, instead of using local servers. The use of cloud solutions at banks currently varies from so-called private clouds (cloud solutions whereby the servers are used exclusively by the bank in question) to full outsourcing of the IT infrastructure to a public cloud solution. The possibility of being able to use the required IT infrastructure much more quickly (provisioning), as well as scalability, flexibility and cost savings are the main motivations for banks to switch to cloud computing.The market for cloud solutions has grown considerably in recent years, primarily thanks to the increasing use of Software as a Service (SaaS) and the maturity of cloud solutions. The market is currently dominated by BigTech parties like Azure (Microsoft) and Amazon, with Google as an interesting challenger.

Illustration 11 - Santander & cloud computing

The Spanish bank Santander is the first worldwide bank that offers its own applications relating to data storage in the cloud as a service to business clients as well. By doing so, Santander wants to make the advantages which its properly secured system offers (a system that must comply with numerous supervisory requirements) available to clients in a market in which a large number of disruptive parties such as Amazon and Google are active.

Profile of Santander
Annual turnover in 2015: €6 billion
Country in which headquarters are located: Spain
Ownership: Public
Year of establishment: 1900
#Employees: 130,000



2.2.6. *Internet of Things*

The so-called *'Internet of Things'* (IoT) is a network of physical objects equipped with electronics, software, sensors and network connectivity with which these objects can exchange and collect data.[34] The IoT ensures that objects can be detected and operated remotely using existing network infrastructures.[35] This makes it possible to integrate the 'real' (physical) world with computer-based systems. The main advantage of IoT is that it aggregates real-time data out of the 'environment' (for example temperature, sound, light, etc.). These are data points and insights which could not previously be monitored. The benefits for the users of the IoT are cost efficiency, the ease of use, access to information and new payment methods. Although the 'IoT' technology is primarily a response to improving convenience, it also helps to reduce the long-term costs, for example in relation to processes and systems.

This expected far-reaching integration of intelligent nodes (devices or applications connected to the Internet) with the consumer's life, also implies numerous challenges relating to privacy and security. Banks are able to help clients with these issues, for example through the use of bank identification for the online identification at other organisations such as government bodies or webshops, or through the safe authorisation of payments via the IoT.

2.2.7. *Biometrics*

Biometrics is used by banks primarily for authentication purposes ('I am who I say that I am') or authorisation by means of human characteristics such as fingerprints, iris scans, voice recognition or even face recognition.

Biometrics can be used to make it easier for clients to interact with the bank, for example by simple authorisation of the payment or faster authentication. Biometrics can also improve the security of, for example, payments or the verification of a share transaction. The use of biometrics is always accompanied by a privacy-related discussion. Set against this background, it is a good idea for banks to find a balance between convenience and privacy. It is also advisable to allow clients to decide themselves to what extent they want to use biometrics services (opt-in). What is more, clients have to be informed fully and clearly about what the biometrics data is used for and which parties have access to it or can use it. Client needs are constantly changing and it is important that they have options with respect to changing their preferences. This technology is also a response to the desire to improve convenience for clients. It goes without saying that banks need to be extremely careful when it comes to the security of biometric data.

The use of biometrics enhances the efficiency and effectiveness of various service channels used by banks, such as the cashpoint, the mobile app and telephone services and transactions. A number of banks are already experimenting with biometrics and have incorporated this functionality into their products and services: Wells Fargo uses voice and iris recognition for authentication purposes in their mobile app and Deutsche Bank uses voice and face recognition in combination with sensors instead of traditional passwords.

Illustration 12 - Voice recognition to gain access to a current account

Since February 2016 clients of the British bank HSBC have been able to gain access to their accounts, via the existing app, using a fingerprint or voice recognition. HSBC's aim is to bring an end to the problems relating to forgotten passwords and increase ease of use and security for its clients.

Profile of HSBC
Annual turnover in 2015: $ 60.7 billion
Country in which headquarters are located: Great Britain
Ownership: Public
Year of establishment: 1865
#Employees: 264,000

[34] Gartner, *IT Glossary Internet of Things*
[35] *HBR Verizon*

2.2.8. Robotics

Robotics technology comes in various shapes and sizes and can be widely applied[36]. The added value is primarily in the '*augmented and collaborative working model*'[37]. Robotics can help automate, improve and accelerate existing work processes and systems, and, to a certain extent, assume the manual and cognitive role of employees.

Current and future robotics applications fall into the following categories:

1. *Smart machines*, such as new cashpoints and vending machines;
2. Robots as service staff in the field of content production (*robot writers*), advice (*robo advisers*) or personal assistance (*so-called smart agents*);
3. Smart or autonomous vehicles such as drones for the collection of data and documents or for the issuing of physical products.

Various banks are experimenting with the use of robotics. For example, the Bank of Tokyo-Mitsubitshi UFJ uses a robot called Nao at its *flagship* store in Tokyo. Nao is 58 cm tall and weighs 5.4 kg and can speak three languages (Japanese, English and Chinese) and helps clients by answering various questions. Nao's big brother, called Pepper, is used at Mizuho Bank.

The use of robotics is not only relevant for the automation and improvement of current systems and processes, but also for the improvement of the client experience and pertains to the convenience factor of the relevance formula. Robotics can, in combination with other technologies such as sensors and machine learning, collect more information from clients and recognise patterns more easily. Apart from simple activities such as greeting clients and talking in another language, robotics enables client wishes and needs to be registered more quickly, while also providing the best responses or solutions faster.

[36] In this section, Robo advice is not categorised as Robotics, but as artificial intelligence.
[37] PwC, *Pulse on Robotics*

2.3. New FinTech parties are on the up and up

Fed by changing client demand and new technologies, new FinTech parties are becoming increasingly popular. Globally, the investments in FinTech more than quadrupled in 2014 (compared to 2013) to more than 12 billion dollars.[38] The FinTech sector is also growing strongly in the Netherlands with 306 million dollars invested in FinTech in 2014, by which the Netherlands attracted approximately 21% of the total European FinTech investments.[39] FinTech is crucial for the Netherlands given the contribution of financial sector to the Dutch gross national product (GNP) (7%)[40]

[38] Accenture, *The Future of FinTech and Banking*
[39] PwC Global FinTech report
[40] Roland Berger and Holland FinTech, *'Barriers to FinTech Innovation'*

It cannot be denied that FinTechs are becoming more and more mainstream and are going to be claiming their position in the financial market. However, the popularity of FinTech is also fraught with problems and real failures, certainly when looking at FinTech start-ups. One example is Quakle, a British peer-to-peer lender, which was established in 2010 and met its demise in 2014 , or the Dutch Symbid which has been suffering huge losses in recent years. In general, most start-ups fail with only a small percentage succeeding. The same applies to FinTech. The popularity of FinTech has caused a change in their influence on the banking sector. The influence is no longer disruptive, but more and more enabling. FinTech companies are finding their place in existing value chains and are improving the products and services of other players.

The American company Moven is a brilliant example of a FinTech company which initially positioned itself as primarily a disrupter of the banking sector. The founder and CEO of Moven is also the author of Banking 2.0, Banking 3.0 and Breaking Banks. These days Moven is no longer a disrupter, but an enabler when it comes to customer experience and personal financial management.

If we look at the FinTech players themselves, what we notice is a number of shared characteristics in their mindset and in their actions.

Shared characteristics:

A keen focus on specific propositions. A lot of FinTech parties have impeccable knowledge of where margins can be earned and where new earning models can be created. However, first and foremost they think from the perspective of the consumer and focus on a particular aspect of banking, looking at a specific product or service. As a consequence, FinTechs are heavily oriented towards the client's experience. From that basis, FinTech parties work together with other players in the ecosystem and slowly expand to other sectors.

Agility. The word pivot, which is taken from the book entitled 'The lean startup' by Eric Ries, has become a key concept in the FinTech world. It stands for a change in the strategy in order to achieve the (consistent) goal. In other words it means always being flexible and aiming to achieve continuous improvement and innovation. FinTech companies often fall under a much milder supervision regime, they often work in other, agile ways and have less of a legacy, which also contributes to their agility. What is more, society appears to accept more entrepreneurship and riskier activities from them.

Switchability. FinTech companies are focused on hyper-scale. The digitisation of processes and services and the availability of the cloud mean that problems with scaling up do not hamper growth. FinTech business models are therefore aimed at achieving as much scale as possible, as quickly as possible in order to realise a relative reduction of costs.

The initial explanation as to why the FinTech sector has grown so explosively in recent years is that the costs of starting up a FinTech are only a fraction of the costs that would have been incurred fifteen years ago. The availability of the cloud, open source frameworks, new ways of working and the availability of developers (developers on-demand), have facilitated rapid technological growth. This, in combination with the market developments in the traditional sector, in which there is more and more acceptance of external innovation, means that this is the right time for FinTechs to flourish.

In the remainder of this section we will describe the influence that FinTech parties have had on five of the most important banking products: investments, payments, loans, mortgages and savings.

Investing

In investment services the first disruption by FinTech companies occurred more than ten years ago when the investment world was rocked by the emergence of online brokers, in the Netherlands by BinckBank and Alex and internationally by companies such as Saxo Bank, Schwab, Optionshouse and Scottrade. These parties ensured that banks' margins on investment services were decimated. New players are entering the market even now, thanks primarily to the automation of advice and execution (robo advice). Players like FutureAdvisor, Betterment and Wealthfront use advanced algorithms to provide automated investment advice. In March 2016 RBS announced that it wanted to replace 550 advisers with robots.[41] One Dutch/English example is BUX which offers a mobile investment app which is intended to make investing accessible and 'fun' (among other things by allowing users to invest for free using virtual money via the 'funBUX'). The idea is to make it attractive for consumers to join in.

Although robo advice appears to still be in its infancy stage, the three European supervisory authorities ESMA (financial markets), EBA (banks) and EIOPA (financial products for consumers) are, in any event, taking this development very seriously. In 2015 they published a joint 'Discussion Paper on automation in financial advice'.[42]

Illustration 13 - FinTech in investing: Bux and Nutmeg

Bux - Investing for dummies

The idea behind the Bux app for mobile investment is that everyone can invest through play and in an easy and accessible environment. BUX's goal is to make investing simpler. What is more, BUX has added elements of play to its app and, by doing so, has given investment a social face. BUX was launched approximately one and a half years ago and now has more than 130,000 users in the Netherlands and the United Kingdom.

BUX

Total assets (2014): € 5.6 million
Country in which headquarters are located: United Kingdom
Ownership: Private
Year of establishment: 2014
#Employees: 11-50

Nutmeg- Automated investment

In the case of the British company, Nutmeg, clients only have to set an investment goal, a horizon and risk tolerance. Consequently, clients no longer need to maintain index trackers because Nutmeg does the investing and advises when it is necessary to deposit more or to set more ambitious goals.

Nutmeg

Acquired capital: $37.3 million
Country in which headquarters are located: United Kingdom
Ownership: Private
Year of establishment: 2011
#Employees: 51-200

[41] Bloomberg Technology, *RBS said to cut 550 jobs as in-person advice moves to web, phone*

[42] The European Banking Authority, *Joint Committee Discussion Paper on automation in financial advice*

Payments

Whereas payments used to be organised exclusively by the banks, we are now seeing new players emerging from all kinds of places. As far as the merchant (acceptor) is concerned, payments have changed from being a utilitarian activity into a strategic theme relating to improving client acquisition, conversion and client retention. That is why there are so many examples, at international level, of major retailers offering payment transactions, such as Walmart and Target as well as Starbucks.

Payment service providers (PSP's) such as Adyen, Buckaroo and Ogone and electronic money institutions (EMIs)[43] *such as Amazon payments now have established positions in the market for online payments.* Banks are trying to fight back with merchant services propositions with which they can become a one-stop shop for acceptors. In addition, virtual currencies such as the bitcoin are being regarded more and more as a viable alternative payment method, while the search is on for ways to use blockchain technology within the framework of payment transactions. (whereby the Dutch Payments Association is currently researching the possibilities of blockchain technology).

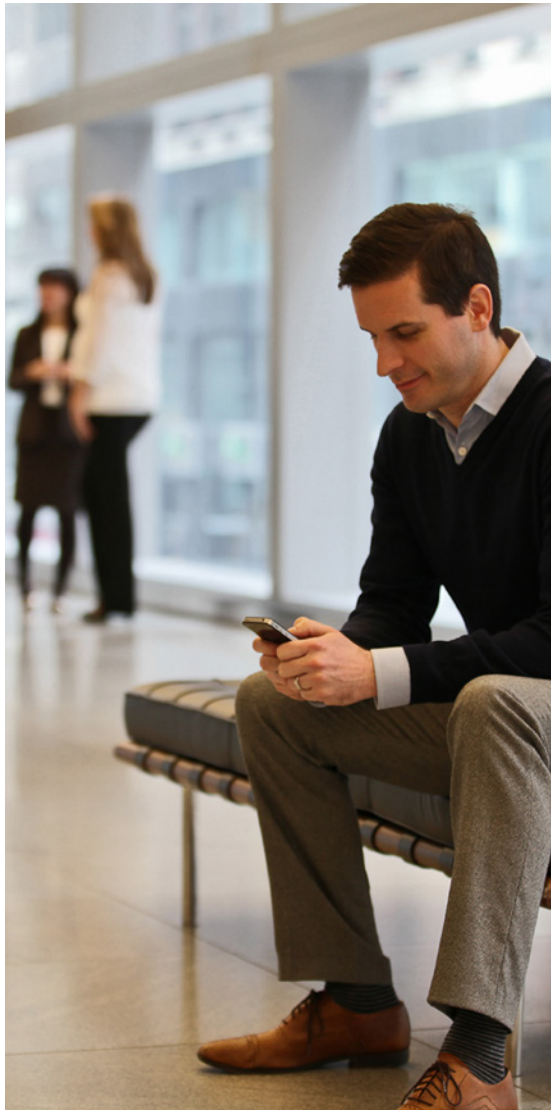
[43] Definition of payment association: An electronic money institution (emi) is an institution that receives funds in exchange for which it issues electronic money which can be used to make payments to parties other than the institution that issues the electronic money. An emi is classified as a credit institution and therefore is required to have, in principle, a licence from the Dutch Central Bank (DNB).

Although in many countries, including the Netherlands, payment transactions in themselves are not profitable for banks, it is without a doubt of crucial importance that banks retain this service. In the first place clients regard the bank with which they have their current account as their own personal bank. Payment transactions also offer commercial opportunities since PwC analyses have shown that cross-selling and upselling can be three times higher in the case of clients with a current account than in the case of clients without a current account. One of the cross-sell products is, of course, the savings account. Lastly, payment transactions offer an insight into the risk profile (including the liquidity) and the client's expenditure pattern, while they are also a source of liquid assets for banks.

The payments sector is changing significantly under the influence of a number of trends and developments:

- Banks are experiencing increasing competition from non-banks. BigTech, FinTech, retailers and telecom companies are investing heavily in payment transactions.
- Payments are moving to the background more and more, with a greater emphasis being placed on the product or service. When using the Uber service, for example, payments which are explicitly authorised by the client no longer take place. After the journey, a price is calculated automatically on the basis of the kilometres travelled and time, with the amount also being paid automatically.
- The growing popularity of mobile cannot be halted. It is even conceivable that mCommerce will outgrow eCommerce in the foreseeable future. This will make the mobile channel an ever-important channel, certainly for payments.
- New technologies like blockchain, the Internet of Things, biometrics and instant payments are all strongly linked to payment transactions. Payment is therefore expected to be a product that will undergo rapid changes in the years ahead.
- *Instant payments*, in combination with other developments such as PSD II, the Payment Accounts Directive (PAD)[44] and mobile, are primarily an enabler for new business models. Thanks to the direct (instant) clearing and settlement of payments, instant payments are expected to generate advantages primarily in the B2B and B2C domain.
- PSD II is changing market dynamics. Under PSD II non-banks can also start playing a role in payment transactions (provided they have the correct licences). More competition for banks is expected from FinTech and BigTech. Even telecom companies, retailers and public transport companies will start to claim positions, as a so-called Third Party Provider (TPP), in the future ecosystem. The combination of PSD II and instant payments may result in interesting new business models for both commercial and retail banking. For example, in the commercial segment, the concept of *correspondent banking* for international payments can be hugely accelerated and simplified. What is more, cash and liquidity management can also take place across various banks faster and more simply. In the retail domain PSD II will potentially have an impact on the primary client relationship. This also revealed that a lot of banks are assessing the opportunities for improving services under PSD II.

While new competitors generally focus on a part of the payment chain, the 'value at stake' for banks covers the chain as a whole.[45] It is a good idea for banks to define their payment strategy based on this entire chain.



[44] PSD II ensures that European area residents are entitled to open an account in any European country.

[45] *PwC, FS Viewpoint Mobile Payment Revenue Opportunities*

Illustration 14 - Aggregators for payment

Adyen, an omnichannel payment provider

Adyen is one of the best known and most successful FinTech companies in the Netherlands. Adyen was established in 2006 and, in a relatively short period of time, has developed well over 250 payment methods for more than 180 currencies. In 2015 the company's turnover was €350 million and it pro-cessed transactions worth approximately €50 billion. Adyen's major clients include Netflix, Spotify, Uber, Booking.com, KLM and Vodafone. This so-called 'unicorn' has various products such as the Adyen Shuttle, a 'point-of-sale' (PoS) solution for retailers to process mobile pin and chip transactions. Adyen is collaborating with the world's largest retailers to implement PoS payment solutions via its omnichannel platform. Adyen is also offering retailers in the US a 'single EMV-compliant' solution.

Starbucks, ordering coffee using your mobile

The American coffee chain processes more than 9 million mobile payments per week worldwide via PoS ('Tap and go') or the mobile app ('Mobile Order & Pay) which accounts for 21% of the total transactions.* Mobile payment via an app has become a huge success because the transactions are user-friendly and are regarded as safe by users. Whilst Starbucks set up the mobile payment system in collaboration with Square, the partnership ended because Starbucks wanted to develop its own payment system.

The coffee multinational is focusing not only on transactions, but primarily on the user experience. The 'Mobile Order & Pay' functionality offers the possibility of ordering coffee in advance and collecting it immediately upon arrival at a Starbucks branch. In this way, the financial side of the transaction is made part of a broader client experience which offers even more convenience to users.

*Source: Starbucks, Q3 2015, First Quarterly Earnings Call (Q1 2016)

Profile of Adyen

Annual turnover in 2015: $350 million
Country in which headquarters are located: The Netherlands
Ownership: Private
Year of establishment: 2006
#Employees: 260

Profile of Starbucks

Annual turnover in 2015: $4.9 billion
Country in which headquarters are located: United States
Ownership: Private
Year of establishment: 1971
#Employees: 191,000

Lending

New parties and initiatives are also becoming apparent on the market for credit lending. For example, there are various initiatives and start-ups relating to peer-to-peer lending (for example LendingClub and FundingCircle), crowdfunding (for example Kickstarter) and the use of social networks to obtain a loan (Vouch). These players primarily use platforms to link supply and demand and therefore represent an alternative to banks.

Besides the fact that these new players make good use of new technologies and business models, they are also able to benefit from changes on the international market. Following the financial crisis, the traditional players have not always been able to meet the demand for financing. What is more, the historically low (and sometimes even negative) interest rates have put even more pressure on margins of traditional players. These circumstances gave alternative, faster and sometimes cheaper providers of financing the space and opportunity to access the market.

Illustration 15 - FinTech in lending (marketplace lenders)

Peer-to-peer lending: individuals borrowing directly from another individual. This involves people finding each other on the virtual market place. Often the amounts involved are small and the loans are provided without any security.

Examples are Lendingclub, Funding Circle, Zopa, Prosper, RateSetter, CreditEase, Lufax and WeLab-Holdings.

Funding Circle – Marketplace for investors
Although the British lending company Funding Circle, which took over the Dutch company Zencap in 2015, does not have a banking licence, it has already issued more than 1 billion euros of commercial credit. It also has sufficient capital in reserve to invest in new markets. Well-known investors, including BlackRock, invested around 150 million dollars in the company and, in return, received more than 10% of the shares.

Although Funding Circle is partially active in the same market as banks, they also cooperate with their banking competitors. The company is collaborating with RBS and Santander in the UK and with smaller local banks in the US. These banks refer clients they cannot help on to the Funding Circle platform. Among other things this saves banks time which they would otherwise spend on risk analyses.

Profile of Funding Circle
Country in which headquarters are located: United Kingdom
Ownership: Private
Year of establishment: 2010
#Employees: 450

Crowdfunding: investors expect a financial (or non-financial) remuneration for their contribution.

Examples are Kickstarter, Indiegogo, Rockethub, Symbid.
The largest crowdfunding website worldwide is the American company Kickstarter. The mission of Kick-starter is to turn creative projects into a reality. Kick-starter claims that it has collected 1.9 billion dollars from 9.4 million users for 257,000 projects relating to films, shows, video games, journalism, gadgets and nutrition. Funders of projects via Kickstarter often receive a tangible reward or an 'experience' which is related to the project they are supporting. One example would be that they would be given the first product to become available.

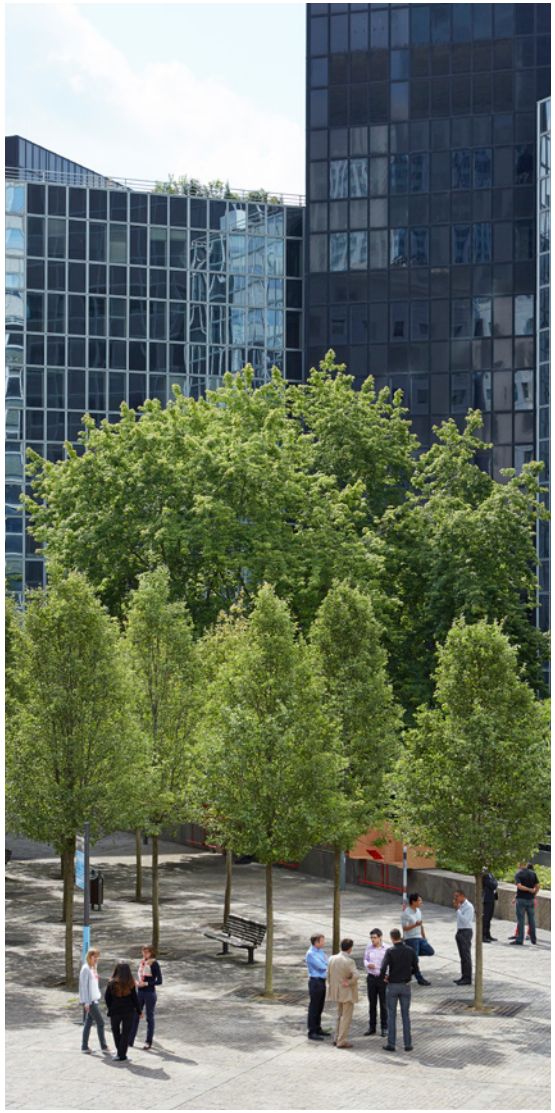
Profile of Kickstarter
Country in which headquarters are located: United States
Ownership: Private
Year of establishment: 2009
#Employees: 132

SoFi - Financing requirement for repayments
SoFi is one of the largest online credit providers in America that offers refinancing of student loans and personal loans and recently also started offering mortgages. SoFi focuses on a higher client segment. This means that, in order to be eligible for the refinancing of a loan, the person in question has to have a permanent job with a certain income, a diploma from a shortlist of universities and a good credit rating. Clients can find out within four minutes whether they are eligible for refinancing, often at a more favourable interest rate than would normally be the case. Rejection does not have any consequences for the applicant's credit rating.

Profile of SoFi
Country in which headquarters are located: United States
Ownership: Private
Year of establishment: 2015
#Employees: 501-1000

A recent study by Cambridge University revealed that the European market for alternative financing is growing rapidly. The market increased in volume sixfold between 2012 and 2014, from 487 million to 2.9 billion euros. The researchers predicted that this market will continue to grow in 2015 as well and estimate that it will be worth 7 billion euros by the end of 2015. Although in an absolute sense, the European market for alternative financing may not yet be that big, the growth figures are, on the other hand, impressive and point towards a fundamental change in the financing market.[46] These studies also show that clients do not always end up doing business with lending parties in the marketplace, because banks are reluctant to provide financing. In more than half of the cases, clients had already received an offer from a bank. What is more, the greater speed at which financing could be obtained was referred to as one of the most important reasons for obtaining financing via marketplace lending.

Currently, the alternative financing market is barely regulated while, logically, certain risks are attached to new, unproven business models and providers. One example is the fraud that recently came to light at Lending Club, which meant that one of the most distinctive unicorns of recent years is now getting a great deal of negative press.[47] This underlines the need for the sector to be regulated, both because of the social interest and due to the need for clarity and uniformity for market players. The UK is leading the way as far as regulation is concerned, with specific rules for alternative finance. In contrast, other countries only have non-specific regulations.[48]



[46] University of Cambridge, Nesta: *UNDERSTANDING ALTERNATIVE FINANCE*; The UK Alternative Finance Industry Report 2014, Nov 2014 (Sponsored by PwC & ACCA)Source: University of Cambridge; The European Alternative Finance Benchmarking Report. Feb 2015 (Sponsored by EY)

[47] The American Justice Department is investigating Lending Club, and it has now become clear that Lending Club may be forced to maintain loans on its balance sheet, as a result of which the business model will substantially change. Source: WSJ, *LendingClub CEO resigns over sales review*

[48] University of Cambridge, Nesta: *Understanding Alternative Finance*; The UK Alternative Finance Industry Report 2014, Nov 2014, (Sponsored by PwC & ACCA)Source: University of Cambridge; *The European Alternative Finance Benchmarking Report*, Feb 2015, (Sponsored by EY)

Mortgages

The newspaper 'Het Financieele Dagblad'[49] reported in May this year that the largest Dutch banks have lost a significant share of the mortgage market, which they are now trying to recapture. Whereas the larger banks still owned approximately three quarters of the mortgage market at the end of 2011, their market share has now dropped to approximately half.

New so-called management parties such as Munt, Venn and Bijbouwe have very rapidly captured positions on the Dutch mortgage market. At the moment these positions are primarily in the standard segment (straightforward mortgages with a National Mortgage Guarantee [Nationale Hypotheek Garantie] (NHG), or mortgages with a favourable Loan-to-Value). However, different parties are also active elsewhere (for example Hypo-trust, a party with a focus on existing homeowners and switchers outside the NHG segment). Parties can also gain ground at distribution level compared to traditional mortgage lenders.[50]

These new mortgage providers have a different business model and work using money from large investment funds. The expectation is that the capital that has flown into the mortgages market via these management parties in recent years will increase.

Apart from these new players, the Dutch banks will also experience more and more competition from foreign banks which regard the Dutch market as a reliable one.

Illustration 16 - FinTech in mortgages

Quicken Loans works exclusively online and has issued mortgage credit agreements worth more than 200 billion dollars since 2013. These days it is the largest online mortgage lender in America and the second largest credit lender for consumers.

Profile of Quicken Loans
Country in which headquarters are located: United States
Ownership: Private
Year of establishment: 1985
#Employees: 251-500

The emergence of these new parties is resulting in more competition on the Dutch mortgage market and cheaper mortgages for consumers who no longer have to bear any, or only a minor, risk.

[49] FD, Banks fight to reclaim their position in the mortgage market [Banken vechten zich terug op hypotheekmarkt]
[50] IG&H Mortgages update Q2 2015

Saving

Until recently, people thought that the savings market would be immune to the disruptive force of FinTech. After all, an institution that offers savings products is required to have a bank licence. Nevertheless, new players have positioned themselves on the savings market in between the banks and clients. These are the so-called *aggregators* that have become specialised in saving products, such as Safened, Savedo and Raisin. These players help savers find the most favourable savings interest rates at European banks that fall under the deposit guarantee system. As a result of this, the competitive pressure on banks has also increased in the market for savings products.

Illustration 17 - Aggregators for saving

Three saving aggregators are active on the European market: Raisin, a German startup that provides access for retail clients to saving products offered by European banks covered by the deposit guarantee system. After completing a simple registration procedure, clients have access to more favourable interest rates free of charge via a platform. This gives partner banks access, in a simple and scalable way, to savings of Europeans at low and variable costs.

Savedo is also a German FinTech party that constantly searches, on behalf of its clients, for the best saving products offered by European banks. This takes place via a free reference account managed by Savedo.

The British company Safened offers not only the aforementioned service for savings accounts but also the possibility for asset managers to spread term deposits of their clients across a number of banks in north-west Europe and across a variety of deposit guarantee systems.

Raisin
Acquired capital: $273.3 million
Country in which headquarters are located: Germany
Ownership: Private
Year of establishment: 2013
#Employees: 51-100

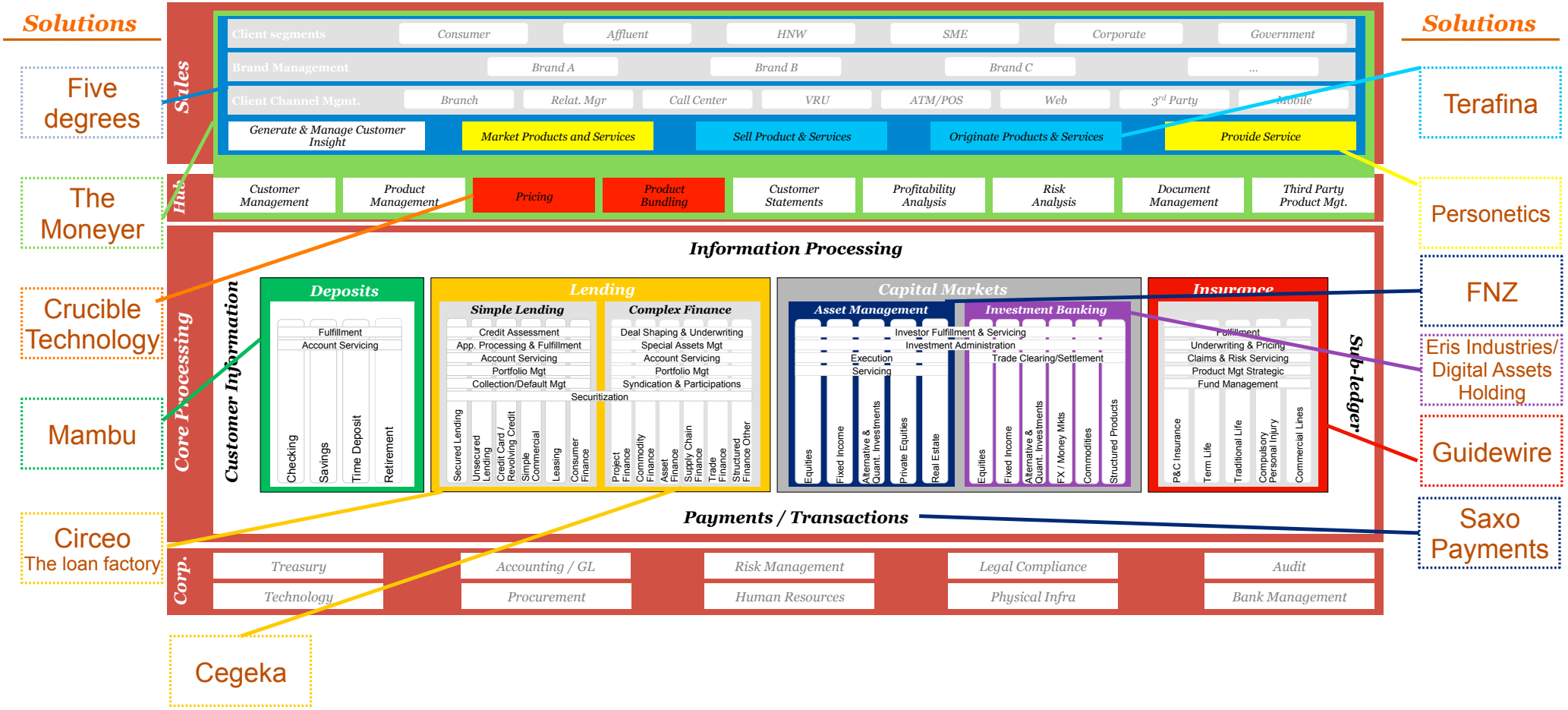
Savedo
Acquired capital: $5.6 million
Country in which headquarters are located: Germany
Ownership: Private
Year of establishment: 2014
#Employees: 11-50

Safened
Country in which headquarters are located: United Kingdom
Ownership: Private
Year of establishment: 2013
#Employees: 1-10

Talking about a situation in which banks and new players are constantly diametrically opposed does not do justice to the complexity and the dynamism of the banking landscape. These days, there is more and more talk about a development towards a new 'FinTech ecosystem'.

In that ecosystem, traditional banks, established banking service providers and FinTech start-ups are working together and are competing with each other to develop and offer innovative banking products and services. Banks are - internally and remotely - setting up their own FinTech start-ups, are investing in, or acquiring, existing FinTechs, are integrating FinTech products into their own services and are, for example, participating in Blockchain consortia. The contribution by traditional banks to this innovative FinTech ecosystem is essential in order to stay relevant as providers of banking services. In this context we refer to 'enabling technologies' and 'enabling FinTech'. Examples of this 'enabling FinTech' are shown in the (non-exhaustive) diagram below.

Illustration 18 - Enabling FinTech



2.4. Politicians and supervisory and regulatory bodies are becoming more demanding

Following the crisis, banks are being confronted by a large quantity of new legislation initiatives and regulations. The implementation of these new legislation intitatives and regulations cost a great deal and are causing a change in the banks' business model given that these changes (which result from, among other things, the ban on commission which applies in the Netherlands, Basel III, PSD II, Emir, MiFID II) affect the very foundations of banking. Given their different risk profile, FinTech companies are generally less regulated. Banks are also being confronted with more hefty fines and authorities that do not hesitate to impose them.

New legislation initiatives and regulations also encourage transparency, (new) competition, innovation and lower costs. For example, the European commission recently indicated that it wants to take steps to ensure more effectively functioning cross-border services as regards financial products. One of the most striking examples of initiatives to increase the level of competition in the banking sector is the renewed Payment Service Directive (PSD II) which, among other things, facilitates access for non-banks to the payment details of bank clients and enables them to initiate payments.

Illustration 19 - Examples of objectives in relation to legislation and regulations

Competition

*"To **promote more competition, efficiency and innovation in the field of epayments** "*
Payment Services Directive II

*"SEPA **promotes competition** among banks by removing national borders in the banking industry"*
European Commission

*"The issue of banks being too big to fail is not only about the sheer size of banks but includes also the interconnectedness and complexity of banks and **their business models**"*
Liikaanen report

*"This should **lead to a downward trend in costs and prices for payment services users** and **more choice and transparency of payment services**"*
Payment Services Directive II

Innovation

*"This should **enhance new low cost e-payment solutions** on the internet while **ensuring appropriate security, data protection and liability standards**"*
Payment Services Directive II

*"At a time when the **distinction between payment institutions (...) and Electronic money institutions (...) is increasingly blurred as technology and business models converge** "*
Payment Services Directive II

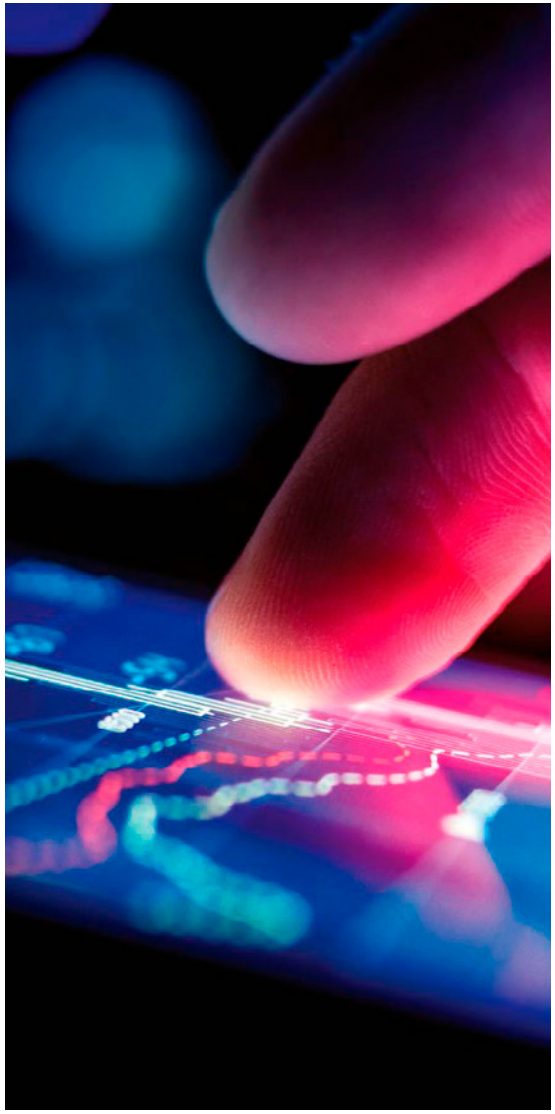
*"The approach supports the **further enhancement of the Single Euro Payments Area (SEPA)** and is consistent with the Digital Agenda, in particular the **creation of a Digital Single Market**"*
Payment Services Directive II

Supervisory authorities are themselves more *data driven*. A clear example of this is the Asset Quality Review which the ECB carried out in 2014 at the supervised banks. The introduction of initiatives such as 'AnaCredit', a new ECB database with detailed information about individual bank loans in the Eurozone, and 'BCBS 239', which describes the requirements imposed by the Basel Committee regarding risk data, is forcing banks to make significant changes to their systems and processes. After all, banks have to provide information in a different way and provide insight so that supervisory authorities can make analyses themselves and compare various banks.

However, banks are having to fulfil the information requirement of other parties as well. The tackling of so-called 'zwartspaarders' (fraudulent savers) has become a priority, partly because of the deficits governments are facing worldwide. For example, in 2010, the US enacted the Foreign Account Tax Compliance Act (FATCA) which forces banks worldwide to transfer information about American clients with the American tax authorities (IRS). As a consequence of this initiative the OESO published a new standard (the Common Reporting Standard) with the aim being to facilitate the automatic exchange of data between tax authorities. These initiatives have resulted in banks having to identify clients in more detail and submit annual reports to the tax authorities about any clients they have with the foreign tax obligation. The above measures mean that the legal framework in which banks have to operate is constantly changing. The changes are having a major influence on banks' earning capacity and are placing a considerable burden on capacity of people and resources available for the innovation of a bank's core processes and products.

Illustration 20 - Supervision of FinTech

"If it walks like a duck and quacks like a duck, it should be regulated like a duck." - John Williams, chairman of the San Francisco FED (on 12 April 2016).[51] Williams acknowledges the positive effect that FinTech is having on the financial sector, but also warns about the risks which are inherent in FinTech and claims that regulation is necessary in order to limit these risks. By way of example he refers to big data which, on the one hand, offers advantages for the sector and society (for example in the context of combating fraud), but is also inextricably associated with privacy issues. Another example he refers to is 'crypto currencies', whereby criminals make great use of the pseudonymity (see bitcoin). Supervisory authorities in numerous countries are still finding out how to fulfil their role in the field of FinTech. In the Netherlands DNB and AFM have indicated that financial innovation is having positive effects on society, but also that the search is still on for the correct level of supervision - a level that sufficiently reduces the risks and does not suffocate innovation in an excess of legislation and regulations.



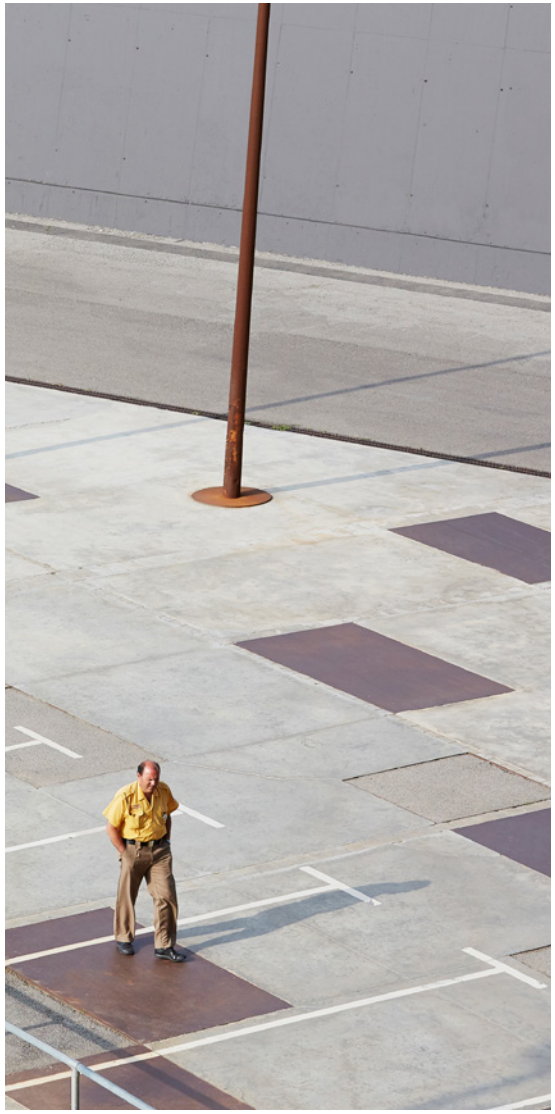
[51] Federal Reserve Bank of San Francisco, *FinTech Power of the Possible and Potential Pitfalls*

2.5. The banks' business model is under pressure

After the crisis, banks worldwide have found it difficult to generate a return on equity (or RoE) that exceeds its costs. These equity capital costs are the shareholder's yield expectation (referred to in the financial sector as the cost of equity, or CoE). In other words, banks are finding it difficult to fulfil the yield requirements of their shareholders (CoE). Whereas the difference between RoE and CoE in the run-up to the crisis still fluctuated at around 10%, partly thanks to high leverage, that difference was negative for many banks for several years after the crisis. The expectation is that a new level of balance can be achieved which will enable banks to generate a return that, on average, is only 1 to 2% above their CoE[52]. This will result in the profitability of banks (and their risk profile) being structurally lower than before the crisis. However, a positive economic spread (this means an RoE which is higher than the CoE) is essential for this to happen. In fact, banks will, if necessary, have to be able to take capital out of the market and this will require them to generate an attractive return for their shareholders.

This structurally lower profitability is the consequence of pressure on both the revenues (by commoditising products, increased competition, increasing transparency of banking products and services, the low or even negative interest rate) and on the costs (for example the costs of IT and compliance). What is more, in recent years banks have had to increase the equity capital due to the pressure of legislation and regulations and supervisory authorities. Although this has led to a reduction in the risk profile and therefore also their CoE, the relatively higher level of equity capital is also has a dampening effect on banks' RoE.

The trends described above have brought even more pressure to bear on the business model. Technological developments, legislation and regulations, changes in the behaviour and the demands of clients, and new market players such as FinTech parties. Banks will have to find an adequate response to these developments in order to guarantee the sustainability of their business model.



[52] *PwC, Banking Industry reform: A new equilibrium*

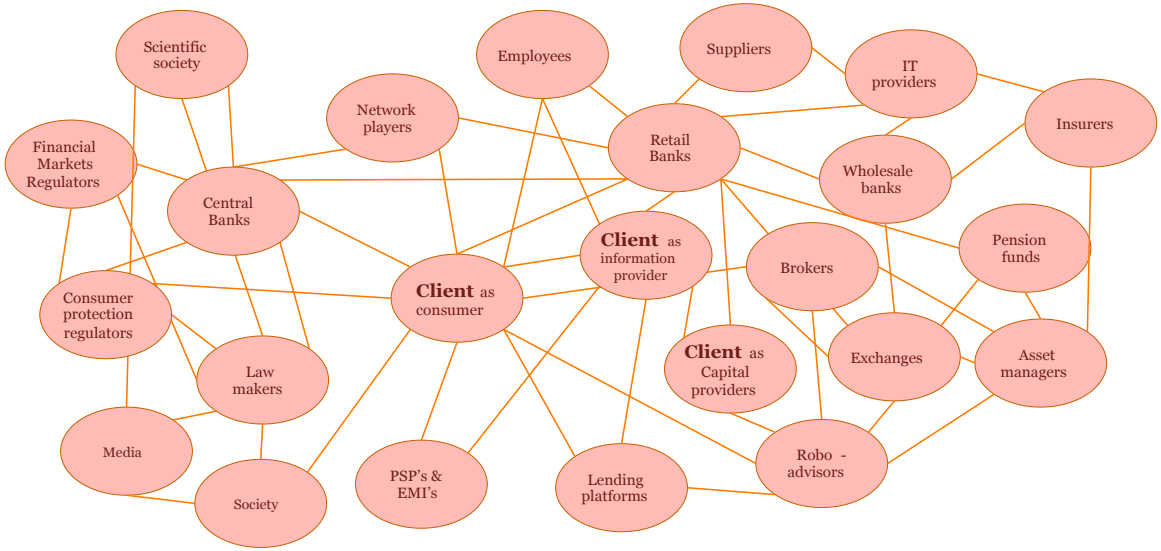
3. Relevance formula

The message is clear: for banks to stay relevant to all interested parties (see diagram below), they must respond properly to the developments described in section 3. In this section we place the emphasis on the relevance of banks for their primary interested party, namely the client. After all, in general, it is the case that, if the bank is profitable and relevant for clients in the long term, this will also serve the interests of the other parties involved.

The *relevance* that banks have for interested parties is the product of three factors: *trust*, *convenience* and *low costs*; the higher each of these three factors in the formula are, the more relevant banks are. None of the factors can be very low or negative.

relevance =
trust x convenience x low costs

Illustration 21 - Overview of the banking ecosystem (not exhaustive)



In this context, trust means that banks are reliable, in other words predictable, transparent and honest towards their clients. By trust we also refer to the degree to which banks can make a useful and valued contribution to the society of which they are part of. This is the foundation for the relevance of

Convenience can be a distinctive, added value of banks for their clients. By convenience we mean, among other things, the degree to which clients are satisfied with their user experiences in relation to the product and services provided by banks and about the speed, stability and simplicity which they experience in the interaction and communication with banks via their chosen channel.

The further ***reduction of costs*** is an essential precondition for banks to be able to supply their products and services against a competitive price which clients perceive as fair. The 'PwC Global FinTech report' shows that Dutch financial institutions regard cost reduction as an important basis for staying relevant compared to other parties (77% of the respondents).[53]

[53] PwC, *How FinTech is shaping the financial services*, 2016

Illustration 22 - Key questions for Dutch banks

The relevance of banks is determined by both external positioning, internal competencies and a coherent strategy which brings together these factors at both a strategic and tactical level within the bank. A number of relevant questions which banks will have to answer for themselves are:

- Which core competencies will remain with the banks and which will not? Examples of competencies are: transformation function, payment transactions, and financing of the real economy.
- The 'way to play': what is the strategic course and timeframe when it comes to the optimal use of the core competencies? This could involve the question of whether the bank should focus on operational excellence, product leadershipp orcustomer intimacy, or the question of whether of the bank wants to be a frontrunner regarding innovation or a smart follower.
- Which added value do banks realise for their most important interested parties?
- With which business model can the bank follow strategy and make optimal use of the core competencies to generate added value for clients and other interested parties in the banking sector?
- In which domains should banks start looking for complimentary parties, technologies or supplementary competences?

Although new technologies and FinTech are often regarded as threats to banks, these developments can definitely also help banks to increase their relevance. This section describes how banks can use new technologies and FinTech in connection with each of the three factors. In this section we also make suggestions on a number of issues which Dutch banks can jointly address when determining their response to new technologies and FinTech.

3.1. Trust

When considering strengthening the level of trust in the banking sector, it is essential that banks achieve consensus with their interested parties about the objectives that they want to achieve.[54] *An ongoing dialogue is necessary between banks and interested parties regarding, at least, the following three objectives:*

Contribution to society

Contribution to the real economy

Financial stability

[54] The annual Dutch Banking Association [Nederlandse Vereniging van Banken] – Trust Monitor [Vertrouwensmonitor] for 2015 states the following on p. 9: 'Increased costs and the remuneration policy are referred to as reasons for low confidence. That low confidence is primarily a result of clients' perception of banks as being insufficiently client-oriented. However, consumers have confidence in banks because there is good guarantee that their money is safe, they consider the supervisory authority to be of a high quality and they have had positive experiences themselves. One striking feature is that consumers' confidence in their own bank is, on average, a bit higher than the score for the sector as a whole (3.2 vs. 2.8 a scale of 1 (very little confidence) to 5 (a great deal of confidence)).'

3.1.1. Our observations in the market

This section describes our observations in the market with regards to the aforementioned three objectives.

1) Contribution to society

Banks are expected, perhaps more than other companies, to behave as good corporate citizens. The positive contribution which banks can make to society in this way can be categorised into two components:

a) Compliance with applicable laws and regulations.
b) Reliable, transparent and honest actions whereby the interest of the clients is at the heart of their actions and which benefit the environment in which the bank operates. Merely complying with applicable legislation and regulations is not enough to be a good corporate citizen. In order to promote this, the government has imposed limitations on the remuneration policy of banks and an obligatory banker's oath has been introduced.

New technologies, and particularly big data, can be useful for both components.

Point a). Compliance with applicable laws and regulations.

Banks will, of course, have to comply with applicable legislation and regulations as a minimum requirement. The following two areas are included as an example of when the use of technology and FinTech can be beneficial.

- ***Know Your Customer:*** Governments are using banks more and more often as a weapon in the fight against tax evasion and money-laundering. Banks are therefore increasingly having to deal with legislation concerning the issuance of information and personal data, for example in the field of *Know Your Customer* (KYC), the American *Foreign Tax Compliance Act* (FATCA) and the resulting *Common Reporting Standard* (CRS).

- ***Preventing fraud and crime:*** The large quantities of data at banks' disposal can be analysed more effectively using new technologies. This is making banks more able to detect transactions and forms of behaviour which might point to fraud, money-laundering and other types of crime. In doing so, banks are not only making a positive social contribution, but are also limiting their own financial and legal risks and the possibility of damage to their reputations. In recent years, several banks have been fined due to instances of money-laundering, with an American court imposing a fine on HSBC of almost 2 billion dollars in 2012. Such huge fines are causing banks to be more prudent, due to the fear of the financial impact and reputational damage.

Illustration 23 - Stricter compliance requirements are leading to higher levels of security and an improved client experience

The American Trunomi offers clients the possibility of managing and sharing their identity and personal details safely. Among other things, Trunomi is enabling financial institutions to arrange their Know-Your-Customer process better and make it easier and safer to exchange data. The platform supports online and mobile onboarding, as a result of which clients can exchange the necessary data safely and quickly with numerous other financial institutions. The specific data continues to be owned by the client and can be effectively validated and approved via Trunomi. When entering into new banking relationships, Trunomi increases the level of security and takes steps to improve the client experience.

Point b). Reliable, transparent and honest actions with a genuine focus on the interest of clients

Banks have a great deal of data about their clients at their disposal. Using big data technology, banks can extract valuable information and insights which allow them to inform their clients more effectively and serve them better. Often banks, ostensibly, have an advantage in this respect compared to new FinTech parties which do not (yet) have such a huge amount of client data available. This seems apparent, however, consumers and society appear to accept less from banks when it comes to using data as opposed to FinTech parties. Banks will therefore have to deal with client data more carefully than other providers if they want to use this to increase their focus on clients. Innovations in this field can only succeed if clients actively participate in product development. It is likely and understandable that clients will first want to see some return on the use of their data, for example in the form of greater convenience, personal, relevant offers and advice, and lower costs.

- ***Financial insight and self-reliance:*** Banks can consider giving consumers more insight into and transparency with regards to the considerations they take into account when it comes to credit lending. FinTech parties can help to provide transparency to clients as to how

Illustration 24 - Fair Isaac Co. and CreditMantri, providing insight and transparency into banks' considerations when issuing credit

Fair Isaac Co. is the provider of the credit rating most commonly used by credit lenders. Fair Isaac Co. is collaborating with a number of large parties in order to give clients insight into their personal credit rating. Financial institutions can themselves decide which weightings to give to the various types of source data. For example, a financial institution can itself decide how much value it attaches to the repayment of credit card debts or mortgage. Identity fraud can also be discovered more quickly; credit ratings which drop without a client being able to explain why, may be a signal of fraudulent behaviour.

Profile of Fair Isaac Co.
Annual turnover in 2015: $232.8 million
Country in which headquarters are located: United States
Ownership: Public
Year of establishment: 1956
#Employees: 2,646

CreditMantri is an Indian startup, established by a number of ex-bankers from Citibank, that gives clients advice in order to improve their credit rating. By doing so CreditMantri also increases access to credit for its target group. What is more, Credit-Mantri has its own platform on which 13 banks offer their services whereby they rely on the credit rating which is determined by CreditMantri using advanced analytics.

Profile of CreditMantri
Country in which headquarters are located: India
Ownership: Private
Year of establishment: 2012
#Employees: 11-50

their credit rating is determined and used by banks. New technologies in combination with the large quantity of data that banks own, offer possibilities for providing better information to clients about their financial position and in relation to financial decisions. Aggregators can also play an important role in offering clients a total overview of their financial position, as well as offering better alternatives for existing financial products. Aggregators can in this way contribute to consumers becoming financially self-reliant.

- ***Social antennas:*** In order to keep in touch with developments in society and people's views of them, more and more banks are using social data or social intelligence. A wide range of applications are available (see examples below) and they all have advantages for both clients and the bank. Monitoring what clients, partners, suppliers and other interested parties say or publish online and offline is extremely important in order to stay up-to-date and respond on time where necessary. Social intelligence can, among other things, be used in the context of product launches, reputation management, audits, maintaining relationships with interested parties and crowdsourcing.

Illustration 25 - Use of social media and the crowd to improve customer service

Customer service via social media: save costs and increase client satisfaction

Customer service via social media is becoming more and more popular and is an excellent way for organisations to show their 'human' side and to demonstrate that they are truly concerned about the interests of their clients. A recent report showed that the leading brands are embracing this principle in order to increase client satisfaction and client loyalty and, at the same time, reduce their customer service costs. In order to achieve this, 94% of the best performing organisations are focusing on reducing response time. Apart from reducing costs this also creates a situation in which clients see their complaints being dealt with quickly and efficiently via social media and therefore become more likely to recommend the organisation to others in the future..

Source: Gleanster research, 'How Top Performers Use Social Data to Improve Customer Service and Support', 2013

Illustration 26 - SmartyPig, online saving

SmartyPig offers free online saving accounts to clients who have a specific savings goal, with a variable bonus available for extra payments. The SmartyPig approach involves using 'social money' as well, with the client's family and friends easily able to make donations online. Clients who reach their savings goal can then easily purchase the items they desire online, often on the basis of a special discount from SmartyPig partners. In this way, information about clients is collected with regard to their spending habits and objectives and this, in turn, makes it possible to create a more accurate segmentation and ensure that clients only receive special offers which are interesting and relevant. This increases the level of convenience for the client and research has shown that clients regard this as being very client-oriented.

Profile of SmartyPig
Country in which headquarters are located: United States
Ownership: private (strategic partnership with BBVA Compass)
Year of establishment: 2007
#Employees: 23

2) Contribution to the real economy

One of the main functions of banks is to finance the real economy. However, stricter capital requirements and the large amount of real estate financing on the balances of banks minimize the leeway that banks have to do this. A focus on the relationship between financing movable and immovable property is important for the contribution to the real economy.

FinTech parties that focus on credit lending do not, in general, constitute a new source of financing. They do not take any risk involving their own balance sheet but simply transfer risks between issuers and consumers of credit. FinTech parties such as crowdfunding providers, peer-to-peer lenders and aggregators offer bank clients access to alternative sources of financing. Collaborating with parties like this is therefore a way for banks to serve groups of clients who would normally not be eligible for credit. Such clients would, for example, be those who do not yet have a track record when it comes to credit lending and consequently find it more difficult to obtain a loan.

Illustration 27 - Qredits and Vouch, credit lending 2.0

Qredits and Vouch are two parties that have responded to the need for credit clients who find it difficult to get it.

Qredits is a so-called Public Benefit Organisation [Algemeen Nut Beogende Instelling], in other words a non-profit organisation, which helps businesses that do not have access to the various (financial) services of regular providers. Qredits offers various forms of credit such as micro credits (up to 50,000 euros), SME credits or mortgage credit (ranging from 50,000 euros to 250,000 euros). Qredits supports borrowers with personal coaching and with tools such as e-learning, white papers, tips from other entrepreneurs and other sources of inspiration. This form of credit enables (new) businesses to acquire economic, financial and social independence.

Profile of Qredits
Assets on 31 December 2013: €97 million
Country in which headquarters are located: The Netherlands
Ownership: Private (non-profit organisation)
Year of establishment: 2008

#Employees: 46
Vouch depends on the trust friends have in you. When someone applies for a loan, friends can help by guaranteeing a self-selected amount. These friends will only have to pay the amount in question if the borrower does not fulfil its obligations. A strong network of sponsors can ensure a higher loan, a lower interest rate or even both.

Profile of Vouch Financial
Country in which headquarters are located: United States
Ownership: Private
Year of establishment: 2013
#Employees: 11-50

3) Financial stability

A stable financial system is a condition for a healthy economy and a prosperous society. In order to make a contribution to financial stability, and therefore be an unmistakable part of such a system, banks have to be financially healthy themselves. That requires a long-term, future-proof business model that achieves a balance between profitability - necessary to keep solvency at the right level, to finance investments in the future and to offer a return to shareholders and savers - and an acceptable risk profile.

The primary objective of policymakers since the financial crisis has been on making the banking sector more stable and limiting the risks. To that end, new legislation and regulations have been introduced (at global, European and national levels) and the set of instruments available to supervisory authorities has been changed. What is more, supervisory authorities are becoming more data-oriented. They use 'raw data' to draw up risk profiles of banks themselves and less often base this work on risk reports submitted by banks (data analytics). Concrete examples of this are the approach to the Asset Quality Review by the ECB, the requirements that the Basel Committee imposes with regard to risk data (BCBS239) and AnaCredit (a new ECB database with detailed information on individual bank loans in the Eurozone, intended for statistical research and monetary policy).

The increased requirements which supervisory authorities impose on managing of and reporting on data offer room for companies to emerge that are specialised in 'RegTech', a contraction of regulations and technology. Services offered by RegTech parties mostly consist of configurable, easily integrated, reliable and cost-effective cloud solutions for the management of risks. For example, RegTech parties enable banks to produce new reports from existing data and systems on time and in a cost-effective and flexible manner, without the risks and costs associated with replacing legacy systems.

Blockchain is, in addition to data analytics, another new technology which increases transparency and improves risk management (see section 3 for a description of blockchain technology). 'Compliance in advance' and complete transparency are promises inherent to blockchain technology. The Nasdaq technology stock market and the Boardroom start-up are already using blockchain technology to improve risk management and *governance*.

Technologies can therefore contribute to the financial stability of the banking sector. FinTech can do the same by, for example, making the landscape more multiform and encouraging competition. At the same time, it is clear that a number of FinTech start-ups are vulnerable as a result. Supervisory authorities can be expected to take their responsibility in informing clients on this matter. They also have an important role to play in the financial education of consumers regarding the increased diversity of products and services.

Illustration 28 - Risk management 2.0: Blockchain

One example of risk management via blockchain is already up and running. Nasdaq conducted a successful pilot with Nasdaq Private Market. While shares used to be traded via an informal system (such as spreadsheets), it now takes place via a shared cash book (based on blockchain technology). Blockchain therefore offers a central database which is accessible to all parties and also fosters trust between parties that transactions are implemented when they comply with the rules (meaning that clearing is no longer necessary). Another example is the Boardroom start-up that supports the governance of an organisation using blockchain technology. Boardroom does this by encapsulating the process of submitting proposals, voting and the like in a 'smart contract', as a result of which the agreements are always transparent for everyone, with the guarantee that they will be executed as agreed.

3.1.2. Implications for banking activities

Possible matters for individual banks to focus on

Banks can use new technologies and FinTech to take action at various levels to increase people's trust in them. The following activities could be carried out by individual banks:

1) Contribution to society

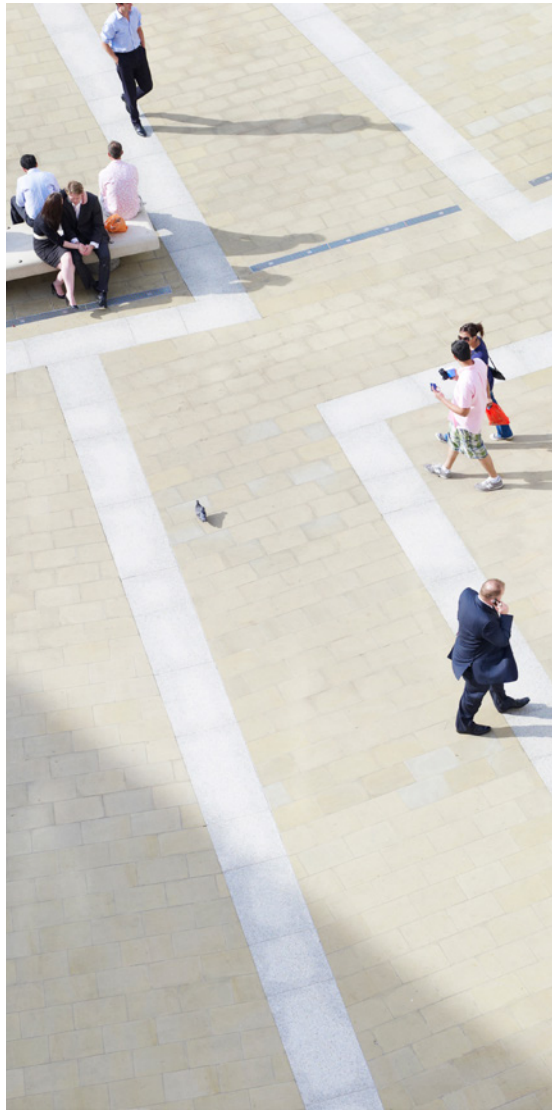
- The use of new tooling and FinTech for *compliance*. This will enable banks to comply with legislation and regulations more effectively and at lower cost. What is more, the administrative burden often borne by clients of the bank is reduced. One example is the burden that KYC requirements and AnaCredit cause for bank clients.
- The use of technologies such as *social intelligence* to create a better understanding of client behaviour and requirements in order to generate better content when it comes to focusing on client interest.

2) Contribution to the real economy

- Entering into partnerships with marketplace lenders (crowdfunding, peer-to-peer lending) in order to be able to serve a broader group of borrowers and spread the risks more widely

3) Financial stability

- Using new technologies, such as (the inherent assurance of) blockchain and advanced data analytics, to mitigate risks and to increase transparency and insight.



3.1.3. Possible matters for banks to focus on jointly

Banks also have a shared interest in using new technology and FinTech to increase confidence in the business/banking sector.

1) Contribution to society

- ***(Big) data & privacy:*** For the banking sector there are various reasons to cooperate in the domain of big data in combination with privacy. Banks can actually set themselves apart compared to many FinTech and BigTech businesses by presenting themselves as the guardian of the clients' assets, including the related data and digital identity. This does not mean that banks cannot use client data. However, before they do so they must have a clear and transparent policy. With a view to increasing trust in the banking sector even more, it may help to agree on common rules for using client data and also guarantee a certain level of privacy. This is in the interest of both the client (protection of its data) and the sector (broadening and improving products and services where possible). Banks also have a common interest in engaging in further discussions with the authorities in relation to data protection laws. Violation of these rules can lead to substantial fines for banks, which makes them vulnerable. A discussion about the interpretation and application of the rules governing the banking system would appear to be essential.

- ***IT security.*** In the banking world, more and more data is being exchanged between banks and clients, but also between banks and their suppliers, distributors, partners and other interested parties. What is more, the 'borders' between parties inside and outside the sector are becoming more unclear due to, among other things, PSD II and iDIN. The larger and more complex networks of data and information which arise as a result are making more stringent security measures essential. A greater dependency on third parties can result in operational risks. Processes are becoming more complex due to the prevalence of 'seamless, real-time, anytime, anywhere', which makes it more difficult to identify who can be held accountable.

- ***Diverse range:*** Technological innovation will create a growing diversity of solutions offered from which clients will have to make responsible choices. This means not only solutions offered by new players, but also solutions over which the client has control. One example is the so-called execution only investment-related services, a model whereby the client invests without being advised by banks. This implies the risk of mis-buying for the client, meaning the risk of a client purchasing products or investing in assets which are unsuitable for his or her situation. The same risk also applies to marketplace lending whereby clients, motivated by the low or even negative interest rates, offer their savings to marketplace lenders that, in effect, offer an investment product rather than a savings product. The role of supervisory authorities and regulators is to inform consumers about these developments. This information will, of course, relate to other details on new providers such as data use, privacy and security.

- ***Increasing transparency:*** Banks can increase the transparency of financial products and services and thereby contribute to social well-being. Banks can do this individually (for their own products and services, see above), or jointly approach the supervisory authority and society. A good example of such an initiative is the publication entitled 'Responsible Innovation' [Verantwoord Vernieuwen] by five sector organisations in the financial sector..[55] One of the ten points of the vision of the future referred to by the sector organisations is 'Service provider: make your role transparent'[Dienstverlener: maak je rol

[55] *'Responsible Innovation, Financial services in a rapidly changing world [Verantwoord Vernieuwen, Financiële dienstverlening in een snel veranderende wereld],* The five sector organisations involved are: the Dutch Banking Association [Nederlandse Vereniging van Banken], the Dutch Association of Insurers [Verbond van Verzekeraars], the sector association of independent financial advisers Adfiz, the Private Equity and Venture Capital Association of the Netherlands [Nederlandse Vereniging van Participatiemaatschappijen] (NVP) and the Dutch Fund and Asset Management Association (Dufas).

transparant].[56] The increase in the number of new players on the market and changing value chains and business models is making it more difficult for the consumer to gain an overview, while it is also less clear where the information comes from and who has the duty of care. By playing an active role in the field of transparency, banks can help the consumer, the supervisory authority and ultimately the entire sector and themselves to gain good insight into financial services and products and increase the level of trust therein.

- ***Financial education:*** The increase in the number of parties in the financial sector and the growing range of financial products and services are making things more complex for the consumer. In order to make responsible choices when purchasing financial products, consumers will also have to have sufficient knowledge and understanding. Financial literacy and education are therefore a social requirement which the banks can jointly fulfil by engaging in social dialogue. It goes without saying that supervisory authorities also have an important role to play with regards to informing clients about this increased pluriformity of services and service providers.

- ***A focus on the un(der)served:*** Thanks to technological developments and far-reaching automation the cost of some products and services is lower than used to be the case (for example robo advice), as a result of which products and services are accessible for new target groups. At the same time some new products and services are aimed at a specific group of consumers that are able to deal with these products and services correctly (for example the millennials). However, there are also consumers who are not willing or able to participate in new technologies or products and services. In order to serve this/these client group(s) more effectively, it is desirable to hold a dialogue between the banking sector and society, so that concrete ideas on this issue can be developed (with due regard for the next point).

- ***Payment transactions:*** The importance for society of a robust and safe payment infrastructure is evident. In this context banks also have an interest in ensuring that new payment transactions parties are sufficiently egulated in order to mitigate risks in the financial system.

- ***Common standards:*** One of the technological developments is the API which makes data (more easily) available to third parties. It is highly preferred, for parties in the ecosystem that exchange data, to use standards. One example is the use of standard APIs within the framework of PSDII, which is inherent to the opening up of data to other parties. Another example is the use of standards relating to identity details, as also used in the QIY network (aimed at a network of several parties). [57]

[56] 'It is our responsibility to ensure that it is crystal clear to clients which financial service provider they are dealing with. All providers of financial services must be transparent about their activities, the guarantees they offer and the responsibility they take. Although that already applies right now, new players and new business models will lead to an ever-increasing number of combinations of financial products with non-financial services. We want to see more and more market parties creating ecosystems in the financial services sector which supply additional services to clients in a broader value chain. For example the covering of risk can be combined with service in the field of prevention'.

[57] *Qiy Foundation*

2) Contribution to the real economy

- Banks can jointly adopt a position with respect to encouraging FinTech parties that are able to offer clients alternative sources of financing in situations where banks are unable to do so. The comparison can be made here with the establishment of the Netherlands Investment Institution [Nationale Investerings Instelling] (NII) and the Netherlands Investment Agency [Nederlands Investerings Agentschap] (NIA). The NII participants are pension funds, pension providers and insurers. They are prepared to invest billions of euros in the Dutch economy by participating in the NII which makes investment projects for, among other things, the SME, sustainable energy and infrastructure, and environmental projects more suitable for investment. The NIA is a public service organisation which will put forward Dutch investment projects for the European Juncker fund, which offers favourable conditions for investments in order to stimulate the European economy. Examples of such projects are the large-scale initiative to make the Dutch economy greener, innovation and SME, strategic infrastructure and rail links in border areas, as well as broadband and fast Internet in rural areas of the Netherlands. Banks could jointly support FinTech parties which make a contribution to the real economy by providing them with expertise or company financing.

3) Financial stability

- Banks can jointly engage in a dialogue with supervisory authorities (as well as regulators), at both national and international levels,[58] regarding how to respond to new technology and FinTech (see also the DNB report on technological innovation[59]). Innovation means, for example, more experimenting, more newfound partnerships, more agile way of working (with flexibility and 'fail fast' being possible), which implies different challenges in relation to managing risks. A number of issues which may feature in this dialogue are:
  - The accumulation of legislation and regulations leaves little time and budget to innovate and, by doing so, fulfil the changing client wishes, as well as the data requirements of supervisory authorities themselves.
  - Cooperation with supervisory authorities on the use of new technology and FinTech in risk management and *compliance*.
  - The regulation of activities rather than entities, allowing the playing field to become more even compared to the new FinTech. This could mean a light licence (provisional licence), which banks can also use for innovative initiatives. In addition to this, discussions can be held with the supervisory authority about how to deal with the deposit guarantee system that has been created by the existing banks, should new players collapse under the light regime.
- The use by banks of the *regulatory sandbox* as recently proposed by DNB as a way for the supervisory authority to assess banks' innovational capabilities.
- The importance of a safe banking infrastructure, the costs of this for the banks and the FinTech-related risks. This also includes risks which result from the fact that there are numerous FinTech start-ups and therefore a relatively large probability of failure.
- The question of how to deal with large providers of cloud solutions, such as Microsoft, Amazon and IBM, due to the concentration risk with these kinds of parties and the undesirability of data being stored in the US.

[58] The UK is a good example of cooperation relating to FinTech and technological development, with plenty of initiatives being taken by the Bank of England and the *FinTech ambassador*.
[59] DNB, *'Technological innovation and the Dutch sector'* [Technologische innovatie en de Nederlandse sector]

3.2. Convenience

New technologies and FinTech are ideal when it comes to improving convenience for banks' clients. Three quarters of senior professionals in the financial sector questioned during the 'PwC Global FinTech survey', were inclined to say that traditional players have focused more on the client due to pressure from FinTech parties. [60] ***No matter whether a technology push or a market pull*** [61] ***is taking place, the client expects more convenience from the banks. The most important driving factor behind the adoption of technology is the changing attitude of clients towards technology. In recent years the use of technology has become so fundamentally embedded in various aspects of our lives that consumers will also be inclined to start using technologically innovative options for banking products as well.***

For the client, the user experience is one of the most important aspects of the relationship with the bank. That user experience is determined by, among other things:

- direct interaction with the bank and with that directly effective products and services (instant) with a high degree of security and quality;
- omni-channel with an emphasis on mobile: always, everywhere, instant and intuitive;
- straightforward (seamless), comprehenisble and understandable;
- transparent, clear and comparable;
- more personal and relevant offers.

Illustration 29 - Cooperation between traditional players and new players in order to enhance convenience

Market innovations, advantages for established parties and new players?

Open infrastructures and aggregators such as Blendle, Netflix and Spotify demonstrate that successful innovations originate, in many cases, from partnerships between established parties and start-ups or scale-ups. Each of the parties referred to has shaken up a market by providing its own distinctive disruptive service: Netflix in television, Blendle in news and journalism, and Spotify in music.

These services would not exist without collaboration with existing market parties. For example, Netflix concludes agreements with studios such as NBC, CBS and DreamWorks and Blendle collaborates with numerous publishers and can therefore offer more than a hundred publications to clients.

The examples referred to concern new parties that 'lease' existing content from established parties to the end user via a licence or a comparable model. As far as established parties are concerned this is one of the ways in which they can further market their products. Established parties can also offer these new functionalities, products and services of start-ups themselves as white-label products.

[60] PwC – *'How FinTech is shaping the financial services'*, 2016
Note: established institutions to regard themselves as less client-oriented than FinTech: *"Among the respondents that regard themselves to be customer-centric, 77% put FinTech at the heart of their strategy. While among the respondents that see themselves as slightly customer-centric, only 27% put FinTech at the same level."*
[61] *push* implies that an innovation is driven by technological innovation or FinTech and *pull* implies that an innovation is developed in response to an identified need in the market.

3.2.1. Our observations in the market

In this section we describe our observations in the market concerning the role played by: the rise of the super consumer, the emergence of new players and substitute products, and new legislation and regulations with regards to user convenience.

1. Digitisation contributes to the development of the super consumer

In section 3 we described how client wishes and expectations change and what this means for banks and other service providers. Truly placing a client at the centre of your strategy by structuring activities and company processes on the basis of value creation for the client, is becoming an increasingly important strategic theme.

2. Emergence of new players and substitutes (and complementary products) in the market

Banks are constantly looking to launch new products. These innovations often consist of an improvement of the front-end of, for example, user interfaces or greater user convenience of existing products. The various peer-to-peer payment applications launched in the past year are good examples of this.

Various disruptive technologies are not only changing client demand. Value chains are also being broken up and new players and substitute products are nestling therein. FinTech and BigTech parties are focusing on specific elements of the value chain or regarding their banking products as a supplement to their existing business. The recent study titled 'Technological innovation and the Dutch financial sector' [Technologische innovatie en de Nederlandse financiële sector] by DNB describes various scenarios, including the scenario in which the value chain is broken up by the inclusion of very specialised products and services (in the value chain), and the scenario involving a complete substitution or 'absorption' of the value chain by new players and substitute products.[62]

The expectation is that the range of real substitutes for banking products and services will continue to grow, certainly if further stimulated by technology and legislation and regulations. *Blockchain* for example makes it possible to share a database, in more or less real time, with participants whereby not only transactions but also agreements (smart contracts) can be saved in the database. Consequently *blockchain* has the power to replace numerous products and services partially or completely, with examples being:

payments - an open cash book with everyone's payments, without bank or supervisory authority (see the use of bitcoin in the paragraph about trust).

clearing - a shared database with everyone's transactions (and balances and possessions) means there is no need for a clearing house. One player who is already actively focusing on this is Digital Assets Holding[63] (among others for Australian Equity Market).

trade finance - agreements with parties throughout the entire chain are transparent and their execution as agreed is guaranteed. One player that is already actively focusing on this is Bank of America.[64]

Illustration 30 - Lending Club, new business model

Note: Fraud recently came to light at Lending Club, which meant that one of the most distinctive 'unicorns' of recent years is now getting a great deal of negative press. The American Justice Department is investigating Lending Club, and it has now become clear that Lending Club may be forced to maintain loans on its balance sheet, as a result of which the business model will substantially change.

Profile of Lending Club
Annual turnover in 2015: $383 million
Country in which headquarters are located: United States
Ownership: Private
Year of establishment: 2006
#Employees: 13,000

[62] DNB, '*Technological innovation and the Dutch financial sector*' [Technologische innovatie en de Nederlandse financiële sector]

[63] Digital Asset
[64] Coindesk, '*Bank of America Latest to Conduct Blockchain Trade Finance Trial*', 1 March 2016

3. (New) regulations are intended to increase client convenience

In the banking sector various guidelines and regulations are being introduced with the aim to increase market competition, reduce prices, increase user convenience and, of course, lower the risks faced by financial institutions.

Of all the new regulations, PSD II and the accompanying PAD are expected to cause the most drastic changes, in the form of new products and services, players and other client benefits. In a nutshell, PSD II concerns the publishing of a current account to third parties with explicit permission from the client. PSD II has a number of objectives, including encouraging innovation in new markets, protecting consumers and personal data and regulating 'new' market players such as payment institutions. PSD II gives new market players leeway, because they can use the available data and as a consequence, can operate between the banks and their clients. For the client this means new or adapted products which, for example, offer more convenience, transparency and/or speed. For existing banks this means being compliant with PSD II, making the required investments in infrastructure, privacy and security in order to grant access to third parties, as well as opportunities for client acquisition and new business models. There are certainly still two unknown, but important factors: which innovative services are going to be launched and will clients adopt the services?

3.2.2. *Implications for banking activities*

The emergence of the so-called *super consumer* means that banks have to take into account this new type of client. The rapid succession of wishes and expectations of these *super consumers* means it is essential that banks are flexible enough to offer new products and services quickly. Banks have to work in an agile way, with a rapid time-to-market as regarding to new, adapted products and services, while under increased pressure from both new players and new regulations.

Possible matters for individual banks to focus on

Using (client) data to personalise services. The *super consumers* expect the products offered and the interaction with the bank to be personalised. The client data that banks have means they are able to personalise products and services. This is already happening in the US, for example by Cardlytics.[65] In the Netherlands this trend is also noticeable, with examples like The Moneyer.[66] Of course, the use of client data goes hand-in-hand with discussion about privacy and its protection.

Omni-channel operations: anytime, anywhere, anyplace. Another expectation that clients have is that they can communicate with the bank at any time, anywhere and in any way. Mobile, Internet, offices and other service channels must be coordinated so that these services merge into one another. This places huge demands on IT (real-time access to data across various platforms), and also bank staff have to be able to deal with the omni-channel servicing of clients and not only with one or more separated distribution channels.

New or improved banking products and services. New players offering improved products and services ensure that clients can also expect higher quality products and services from established banks. In the client's eyes banks still primarily offer security, trust and stability, whilst product or service innovations aimed at convenience come in at second place. If the banks want to remain relevant, they will have to score well with clients on both aspects. This means that banks need to be more innovative and effective in order to retain or strengthen their position on the market.

A clear profile is necessary in order to reach the super consumer in an ecosystem with numerous (new) players. With the entries of many new players to the marketplace, such as new banks, FinTechs and BigTechs, there is an abundance of choice for the consumer. Not only are new competitors emerging with comparable products and services, new players are also establishing themselves between the banks and the client as a result of which the primary client relationship is no longer the sole responsibility of the bank. Banks have to make clear choices about their strategy and their profile in order to find a response to this new competition. In the context of the emergence of aggregators, for example, the bank will have to choose between dealing with the competition by being an aggregator itself and, by doing so, aim to retain the client relationship, or specialise on the underlying processing and, with that, accept that it no longer controls the primary client relationship.

Banking ecosystems: make, buy or partner? New players are not only possible competitors, but also potential suppliers, partners or acquisitions. It is important that the banks are open to partnerships on various aspects and consequently start thinking and acting more in terms of ecosystems as well.

[65] Cardlytics serves both *merchants* and financial institutions by analysing (payment) data and using it for personalised offers.
[66] *The Moneyer*

Possible matters for banks to focus on jointly

When considering creating more ease of use for clients, there are various areas in which banks can collaborate.

Cooperation with numerous parties is necessary in order to maximise the potential of blockchain. Blockchain technology is potentially a real game changer. Facilitating transactions and agreements between parties who do not trust each other, means a fundamental change for many services which are still working with so-called trusted third parties. This requires cooperation between a number of parties, because the principle of trust that is safeguarded by blockchain cannot be brought to fruition if it continues to be an internal project. That is why this is an ideal opportunity for Dutch banks to act together and develop blockchain, similarly to the international R3 consortium.[67] Supervisory authorities (in this case DNB and AFM) have indicated that they want to collaborate on pilots. The Dutch Payments Association is already conducting research into the possibilities of blockchain for payment transactions.

(Selective) sharing of market data in order to improve services to clients

In other countries and regions various interbanking initiatives are taking place to improve convenience which Dutch banks could also jointly explore. For example, peer-to-peer payment apps (such as Swish in Scandinavia and Zapp in the UK) and comparison sites for current accounts (such as Midata in the UK). Opportunities exist primarily in the realm of aggregating data at sector level in order to create insights for clients to simplify decision-making and follow-up activities.

[67] The R3 consortium *is a partnership between various international banks whose aim is to continue developing blockchain.*

3.3. Low costs

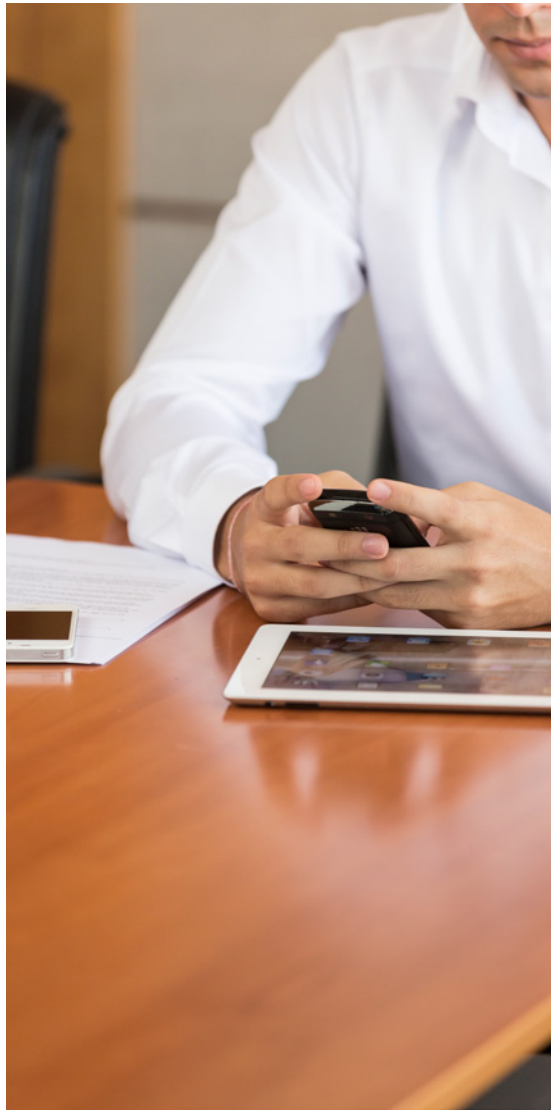
In order to stay relevant for their clients, the sales price of their products and services will have to be kept at an acceptable level, on a structural basis. The fact that banking products are becoming more and more standardised and interchangeable means that the sales price is a very important factor as far as the client is concerned. An acceptable sales price requires the cost price of the product to be low and a satisfactory margin on the cost price which is low enough to keep the sales price acceptable and high enough to generate sufficient profitability for the bank and its shareholders. Although, of course, the focus is on 'value for money' for the client, in a market in which products have become commodities, the cost price and, with that, the sales price are key competitive weapons. It is not the case that FinTechs simply offer products at a much lower price. Those who are truly able to offer added value (for example in the form of convenience) are able to calculate a premium.

The expectation is that, in the coming years, the pressure to reduce costs will increase due to, among other things:

- a lower interest margin;
- more competition from FinTech;
- increased capital requirements (Basel IV, IFRS9, etc.).

The continuing digitisation means that economies of scale and new technologies are having a major influence on the costs of banks. FinTech parties are benefiting from this because they are not restricted by legacy issues and, thanks to new technologies and business models, have relatively low costs (e.g. compliance costs).[68] In this section we describe our observations with regards to costs and cost control.

[68] Partnerships with new FinTech parties can increase the efficiency of incumbents. PwC's FinTech report shows that cost reduction is regarded as necessary due to the emergence of new FinTech parties.



3.3.1. Our observations in the market

Dutch consumers are not that willing to pay for banking products

Traditionally, clients in the Netherlands have not been that willing to pay for banking products. Research carried out by the Consumers' Association [Consumentenbond] has revealed that the costs of current account packages have consistently been one of the top 5 irritations among bank clients.[69]

Payment transaction prices vary substantially between countries and the costs that Dutch banks charge retail clients are generally some of the lowest.[70] A lot of banking products and services are regarded as utilities or 'public benefit products', with consumers generally believing that service provider charges should be minimal. The lack of willingness to pay for banking products and services is striking, certainly when the comparison is made with other products and services which can be regarded as utilities, such as the costs for a subscription for Internet or television. The amount spent per month on the latter is generally a lot more than the annual costs of a bank account[71], while the task of managing and looking after money and the resulting information can be much more important.

This decreased level of willingness to pay means there is continuous pressure on keeping the costs down, particularly in relation to payment transactions. The Dutch payment infrastructure has always been relatively efficient. The low earning potential that results from this makes it difficult to justify investments in the payment infrastructure. On the other hand, the payment transactions for banks are essential for the client relationship and represent a source of client information.

A lack of willingness to pay is also noticeable in the field of mortgages. In recent years, public discussions have taken place about the high interest margins compared to neighbouring countries, including a study of price agreements and cartels.[72] The fact that the Dutch mortgage system cannot be compared with systems in surrounding countries may be an explanation for this.

Illustration 31 - Payments in the Netherlands

Dutch banks stopped using cheques early on, namely as of 1 January 2002. Compared to surrounding countries, a relatively large number of transactions in the Netherlands take place via a bank rather than in cash, and internet banking and mobile banking have been widely adopted. Recent research by DNB and the Dutch Payments Association revealed that Dutch consumers paid for more purchases with a pin card than with cash in 2015[73] Research by the CBS also revealed that, in 2014, 86% of Dutch people made use of banking services via the Internet compared to just 58% in 2005.[74]

[69] Consumers' Association [Consumentenbond], *Banks Monitor [Bankenmonitor]*
[70] The most recent *study* is from 2009, and is no longer relevant. It would nevertheless appear, based on limited observations in the various countries, that the Netherlands still has one of the lowest costs for current accounts. In this context it should be noted that free current accounts are being offered in countries like Germany and Italy.

[71] *~EUR 35 per month for Internet and television* while *current accounts are already available for EUR 17 per year*
[72] Mortgage market sector study: A study of competition on the Dutch mortgage market, ACM survey report 2011

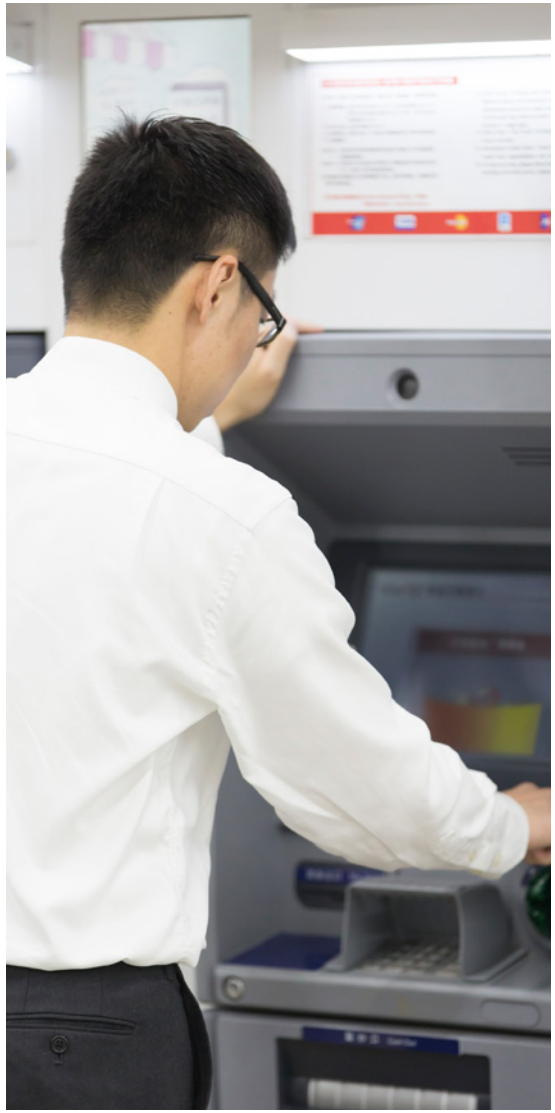
[73] DNB, *'Milestone; for the first time more pin than cash in the Netherlands' [Mijlpaal; voor het eerst meer pin dan contant in Nederland]*
[74] CBS, *'Tablet replaces the plate on your lap' [Tablet verdringt bord van schoot]*

Outdated systems and traditional methods of working are exacerbating the challenge banks are facing

The first digitisation phases were implemented by the banks from the early eighties until the end of the nineties. Although they have continually invested in their infrastructure since then, outdated IT systems and infrastructure are still being used. That is one of the reasons why existing banks are generally, but not always, more expensive and less agile than new FinTech and BigTech parties. This is expressed in the following observations by the various banks::

- The presence of outdated and complex IT systems and interfaces, which are often difficult to maintain, let alone change.
- The fact that systems and processes at existing banks are generally managed by a relatively older (in comparison to FinTech) workforce coupled with relatively higher costs and continuity risks.
- Having often complex, very cumbersome programme management methods. While FinTech companies use scrum and agile methods more frequently, dare to experiment more (and are allowed to do more so by society?) and know how to make use of the concept of fail fast when an experiment does not produce the desired result.
- The still relatively low percentage straight-through processing; banks still make relatively prolific use of more expensive and error-sensitive manual processes.
- A lack of (management) time and budget for innovation at the banks as a consequence of more legislation and regulations and the considerable time involved in maintaining and perpetuating outdated processes and systems.
- The sometimes higher requirements imposed by banks on the robustness of a solution, whether or not as a consequence of the other requirements imposed by society and supervisory authorities in comparison to FinTech.

For these reasons, existing banks are generally more expensive and less agile than FinTech parties. In this context it needs to be pointed out that the first generation of FinTech parties is already having to deal with outdated systems and that the banks are extremely active in relation to updating or renewing their IT system landscape, interfaces and infrastructure. The problem is that these programmes require huge investments, a great deal of time and management focus.



The increasing competition and commoditisation of banking products and services.

Under the influence of, among other things, legislation and regulations and technological developments, banking products and services are becoming more and more of a commodity. Due to SEPA, bulk transaction costs are decreasing as a result of which scale has become an important factor. Another indicator of commoditisation is the price reduction of total packages implemented by two of the four largest Dutch banks in 2016. This development has been most evident in connection with payment transactions. In the field of Internet payments, a large number of bank clients transferred to a payment service provider (PSP) that often offers a better service and more convenience[75], in many cases for a lower price. In specific instances, PSPs are able to ask higher prices for their services if the client regards them as more valuable.

The pressure on prices is also becoming tangible in the field of mortgages. This is being caused by:

- The emergence of new mortgage providers: Since the third quarter of 2015 large banks have had a smaller market share than the new providers with regards to new mortgages.[76] In comparison to the banks these new providers can work at much lower operational cost, while some of them (insurers and pension funds) are aided by the fact that, under Solvency II, in specific cases, lower capital costs apply than for the banks covered by Basel III.
- Decreasing interest margins[77] as a consequence of low interest rates and the significant dependency of banks on interest income.

Illustration 32 - The Bancorp and Ohpen: Banking-as-a-Service for cost reduction

Banking as a Service, the next banking evolution?

Outside the Netherlands it is clear that technology companies like The Bancorp are going a step further and are offering 'Banking-as-a-Service (BaaS) to 'non-banks'. This FinTech company is offering private label services to more than a hundred partners. The Bancorp is no longer promoting itself as a commercial bank, but as a FinTech player that can help other market players with innovative and operational issues.

Profile of The Bancorp

Assets on 31 December 2015: $4.7 billion
Country in which headquarters are located: United States
Ownership: Private
Year of establishment: 2000
#Employees: 762

An example close to home is software developer Ohpen. The company offers a platform for savings and investment accounts that operates entirely in the cloud. Ohpen offers banks and asset managers integrated front-, mid- and back-office systems. A number of small Dutch banks are already using the 'operational excellence' and 'customer experience capabilities' which the Ohpen platform offers so that they can focus on their core activities. This kind of solution helps established banks to reduce the amount they spend on legacy systems, maintenance and personnel.

Profile of Ohpen

Annual turnover in 2015: €3 million
Country in which headquarters are located: The Netherlands
Ownership: Private
Year of establishment: 2010
#Employees: 50

[75] The services provided by PSPs link up better with the processes of companies and retailers thanks to a seamless connection between clients' sales, delivery and financial reporting processes. For example, by means of an automatic link to online stores, ERP systems and stock administration.

[76] *IG&H Mortgage monitor Q3 2015*

[77] *Vereniging Eigen Huis: 'Sharp decrease in mortgage interest margins at banks' [Rentemarges hypotheken bij banken dalen fors], 24 July 2015*

In a *commodity* market, scale is an important factor for success. FinTech players design their systems and organisation in such a way that it can be scaled up easily and relatively cheaply. By contrast, the Dutch banks have gradually withdrawn from their home market during the past ten years, leading to a reduction in scale. Dutch banks cannot resolve the relative lack of scale in the short term. International expansion takes time, requires substantial investments[78] and implies considerable execution risks. However, new forms of technology are enabling banks to replicate scale smartly without having an international presence. The use of cloud and Software-as-a-Service solutions is the most obvious option. A large part of European policy is oriented towards creating a single European market for financial services to increase competition and reduce costs for the end user. In this context, scale is an important factor. This is particularly visible in the field of payment transactions ,[79] with an example being the planned establishment of the Capital Markets Union.

Illustration 33 - Saxo Payments, cost reduction on infrastructure

Saxo Payments, the rising star in payments?

Saxo Payments offers financial service providers the use of its worldwide payment infrastructure. The advantages are the possibility of performing transactions quickly, easily and with low currency risks and the rapid opening or closing of bank accounts in other markets. Saxo Payments offers a low price compared to the costs banks usually incur on their payment infrastructure. The Saxo Payments infrastructure was set up with Oracle and in cooperation with a worldwide transaction bank. Saxo Payments supports 25 currencies worldwide and, among others, SEPA, Faster Payments (UK) and SWIFT, and processes payments as internal transfers meaning that worldwide payments can be instantly carried out. Saxo Payments is also holding discussions with various smaller banks with regards to outsourcing their payment infrastructure to Saxo Payments. What is more, Saxo Payments intends to serve larger banks in the near future.

Profile of Saxo Payments

Country in which headquarters are located: Denmark
Ownership: Private
Year of establishment: 2013
#Employees: 11-50

[78] One might expect that digitisation and further integration of the European market would lower the threshold for international expansion. For the time being, however, international expansion still require a great deal of investment.
[79] *Payment Service Directive*, *Payment Service Directive II*, *Single Euro Payment Area* (SEPA), *Payment Accounts Directive*.

Other low-cost items are the office network, personnel and compliance

Due to the digitisation of their products, banks' real estate has changed from an asset into a liability. Given the competition in the form of often entirely digital services offered by new players, the large network of offices of established banks is frequently a disadvantage.[80]

The above-mentioned developments are forcing banks to reduce costs. Press releases from European banks in the past twelve months have shown that they intend to cutback on thousands of jobs in the coming years.[81] Another important observation in the market is that two of the four large Dutch banks took the deliberate step, at the beginning of 2016, of reporting their so-called cost of compliance: this cost varies from between approximately 100 and 500 million euros, depending on the size of the bank and the method of calculation they use. The compliance costs are now becoming such a large factor that they are a comparative disadvantage for the parties in question.

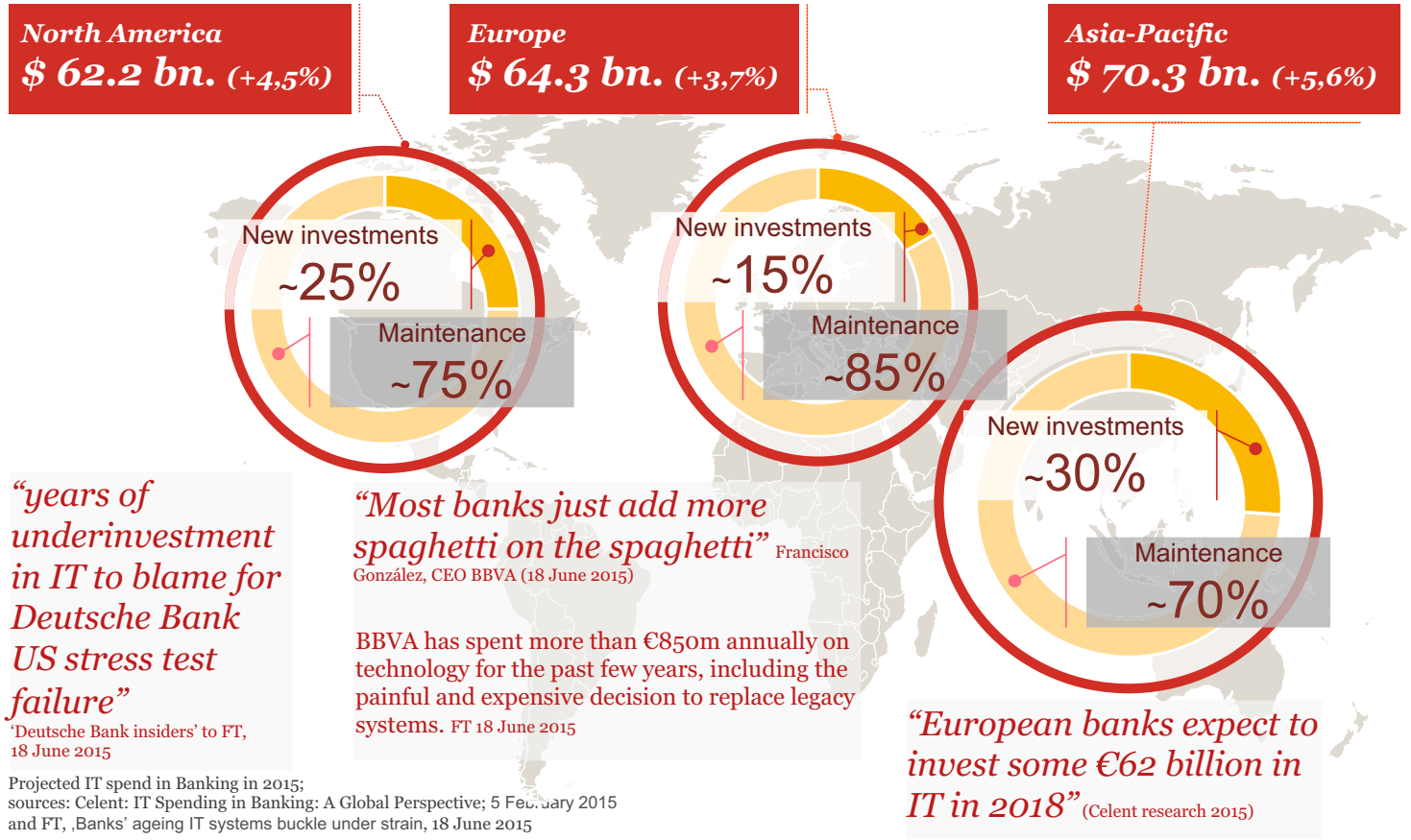
[80] Retail Banking 2020 *'Evolution or Revolution?'*, 2016: *"In 2020, we predict that every bank will be a direct bank; branch banking will be undergoing a significant transformation. As technology enables every aspect of banking to go online, and as cash usage falls away, traditional branches are no longer necessary. Given their high fixed cost, branches will need to become dramatically more productive, or significantly less costly. Banks have already reduced staff levels, closed the most uneconomic branches and started experimenting with new branch concepts".*
[81] NOS, 1 in 3 bank jobs to disappear

Illustration 34 - Circeo, the global Loan Factory

Cost reduction on IT infrastructure
Circeo, provider of 'The Loan Factory', is simplify-ing its IT infrastructure in order to process loans more quickly. Circeo claims that its solution can reduce traditional IT processing costs by between 50% and 80%. This solution can be used fairly broadly across various distribution channels, from bank offices to mobile devices, local markets and regions, and client segments.

Profile of Circeo
Country in which headquarters are located: Luxembourg
Ownership: Private
Year of establishment: 2014
#Employees: 11-50

Illustration 35 - IT investments and maintenance



Projected IT spend in Banking in 2015;
sources: Celent: IT Spending in Banking: A Global Perspective; 5 February 2015
and FT, ‚Banks' ageing IT systems buckle under strain, 18 June 2015

3.3.2. Implications for banking activities [82]

In the years ahead, banks will have to place a great deal of emphasis on reducing cost levels in order not to lose out to the cheaper products and services offered by new banks and FinTech parties. The cost savings which banks realised in recent years have turned out to be insufficient to raise their cost-to-income ratios to levels which can survive the competition with new parties. Banks will have to invest time and money in measures which reduce (basic) costs and increase their earning capacity in the longer term.

Possible matters for individual banks to focus on

- Besides standardising and revamping their IT infrastructure, banks can further rationalise and standardise their products, services and processes. One of the most fundamental ways of saving costs and increasing effectiveness is also to simplify the 'spaghetti' of linked systems and interfaces. The financial sector spends huge amounts of IT and many banks are currently cleaning up their legacy systems on a large scale in order to make them future-proof.[83] An international comparison makes it clear that

[82] Large cost items for banks are the aforementioned network of offices, personnel and IT. This report concentrates on technological developments and FinTech and, despite these overlapping with offices and personnel, the focus here is on the IT costs.
[83] Examples are ABN AMRO with the TOPS 2020 programme and ING with 'Agile' working and Power IT.

banks which have made relatively good progress with this, such as BBVA[84] and Wells Fargo,[85] have made significant investments in their IT in recent years and are now reaping the benefits. Dutch banks are also carrying out similar transformation processes in order to strengthen their position in the market.

- Another way of reducing costs and incorporating flexibility into IT is the use of standard interfaces, so-called application programming interfaces or APIs. Many experts regard APIs as an excellent opportunity to transform the bank's business model and save costs. The faster and simpler linking of internal systems creates a more agile bank which can more quickly meet the changing client needs and demands of supervisory authorities. The often manual usage, checking and maintaining of the many (batch and ETL [86]oriented) interfaces can become significantly cheaper if APIs are used. Dutch and international banks are now making a point of investigating the effects of using APIs in their interface landscape, for both internal and external data exchanges.

[84] For some time now BBVA has been one of the most efficient European banks, and is very effective at managing (IT, staff-related) costs, for example through the direct integration of acquisitions in BBVA's processes and systems. Source: Arthur D Little
[85] For Q3 of 2015 Wells Fargo achieved an *efficiency ratio* of 56,7%, the lowest of the peer group comprising, among others, J.P. Morgan, Citigroup, Bank of America, and Goldman Sachs. Source: Yahoo Finance
[86] *Extract Transform Load*, the interface approach from the past.

Possible issues for the banking sector

The most important cost savings will have to come from individual measures taken by banks. Nevertheless these are also issues which banks can tackle jointly. The existing banks can, a lot more than is currently the case, look to cooperate on activities which do not add any value and are not distinctive. Examples are a common KYC utility and shared payment processing. It is of the essence that investigations are carried out for the sole purpose of deteremining whether this does not lead to any (suspicion of a) violation of competition rules.

- ***KYC utility or KYC factory***: An essential element of the process of becoming a bank's client is the *Know Your Customer* check which banks have to carry out. This check consists of, among other things, an identification phase and often requires the client to visit the bank office which therefore requires time and expense on the part of the bank and consumer. One possible improvement might be in the cooperation between banks in a common *KYC utility*, or *KYC factory*. It is, in fact, possible to share the consumer identification process. A KYC factory would be a third party that manages the documents and identification process on behalf of the various banks. For the consumer this means less frequent visits to the bank office for identification purposes and for the banks it means lower costs for implementing the process. Such a KYC factory could also work with biometrics, with remote identification being one of the possibilities.

- ***Shared payment processing by payment transaction utilities*** which banks can outsource to. Such a *utility* can be set up jointly by Dutch banks, or they can use existing initiatives (see example of Saxo Payments). This will reduce the costs for the payment infrastructure. What is more, a shared infrastructure can be useful for addressing both current challenges relating to stability, security and accessibility, and for anticipating future commercial developments. One of these developments is the increase in the number of transactions. The expectation is that the number of non-cash payments in Europe is going to increase from 70 billion (2005) to 177 billion transactions (2020).[87] In addition, it is important that payment transactions can be processed more quickly.

[87] A.T. Kearney, '*Winning the Growth Challenge in Payments*', June 2013

4. Conclusion

Globally, banks are forming their business strategy in a way that offers a robust response to the challenges of the new digital age in which new technologies and FinTech play a major role. Banks are, in their own, individual way, making a transition, in order to stay relevant for their clients. That transition can take place in accordance with one of the variants shown below, or a combination thereof.

Innovation based on a separate entity

Of course all banks are involved in innovation to varying degrees by developing new concepts on the basis of new technologies. In this situation some banks choose to build an entirely new digital bank alongside the more traditional one. One example is the Buddybank of the Italian bank UniCredit, which is a new 'molecular' bank, exclusively for smartphone users. The name of the start-up bank also embodies its ethos of being a 'buddy': Always by the client's side, ready to help and provide good advice. Buddybank also offers a 24/7 concierge service, alongside three traditional financial products - checking accounts, credit and debit cards and personal loans. The bank can be reached via webchat and telephone and can help with daily tasks such as booking restaurants and taxis and planning trips. Closer to home there is the new online bank called Knab, which is part of AEGON Bank and is an example of a bank which has been built separately from the mother bank..

The entire bank made agile

Other banks have the wish to transform entirely into a new, agile bank. A large number of banks, including JPMorgan Chase, BBVA, Tangerine Bank, Capital One, ING and SEB Bank, have indicated that they are involved in such a transformation based on new agile methods. The advantages of agile development - a way of building software in small pieces and short sprints (iterations) rather than in a large, 'long waterfall project' - are well-known: projects which perform faster and carried out by closely collaborating groups which can quickly adapt to changes, with feedback from the end user throughout the entire process. This is not only leading to faster successes, but also to faster failures (fail fast). The design phase starts at the same time as the development phase (starting with Minimal Viable Products), testing and implementing. The Agile Manifesto, which was drawn up by software developers in 2001 who wanted an alternative to slow project management models, forms the blueprint of the agile concept. While agile methods were originally applied primarily to (software) projects, these days companies have embraced the method, for example, in order to ensure successful change

programmes. Almost every bank of some importance has an innovation lab or centre in order to experiment and learn.

Cooperation between banks and FinTech

Both banks and FinTech parties realise that they need each other in order to be and to stay relevant in the future. Together they are forming partnerships to be able to launch new concepts onto the market quickly. Application Programming Interfaces (APIs) are making it easier to collaborate in this field. For example, Buddybank has an open API IT architecture to simplify partnerships with FinTech, which has been designed to create an ecosystem of the most successful start-ups and services. What is more, the strategy of Fidor Bank, a fully online bank established in Germany and launched recently in the United Kingdom, is to open the APIs for developers in order to create better interfaces and apps for its clients. The British government stimulates more competition in the banking sector and is a great supporter of the increasingly dynamic FinTech industry. By providing an open standard API and demanding that banks open up their APIs to innovative newcomers, the British government can ensure that access is provided to a rich collection of transaction data from financial institutions[88]. This is enabling innovators to develop a series of new products for clients.

[88] *Data sharing and open data in banking: response to the call for evidence.*

Accelerators

Besides boosting their capacity for innovation by working with individual FinTech start-ups, banks are also doing the same by participating in business accelerators. Within the framework of these accelerator programmes, such as Level39[89] and Startupbootcamp[90] FinTech, the banks are providing mentors, knowledge and expertise to help participants develop their ideas. Level 39 in London claims to be Europe's largest technology accelerator for businesses in the field of financial services, retail, cyber security and future cities technology. Startupbootcamp is a pan-European accelerator with annual programmes in Amsterdam, Berlin, Copenhagen, Dublin and Haifa. Earlier this year Rabobank started a cooperation with the Swiss Nexuslab, which is a programme for blockchain start-ups under the Startupbootcamp flag. The partnership gives Rabobank the possibility to work with promising international initiatives in the blockchain field. Banks like Wells Fargo[91], BNP Paribas[92], Barclays[93], Nordea[94], ING[95] and ABN AMRO[96] have set up their own FinTech *accelerators*.

Acquisition and investment funds

Banks are also acquiring (interests in) FinTech parties as a way of using new technologies. The Spanish bank BBVA has already taken over a number of FinTech companies. In 2014 BBVA bought the American online only bank Simple for 117 million dollars. That same year BBVA also bought Madiva Soluciones, a Spanish start-up specialised in big data and cloud computing. In November 2015 BBVA paid 45 million pounds for a 29.5% interest in Atom, an online only retail bank in the UK. In April this year BBVA announced the takeover of Holvi, an online only bank for entrepreneurs and SMEs in Finland which was established in 2011. Cathy Bessant, head of Technology and FinTech at Bank of America, also has a substantial budget to spend on innovation. She apparently stated that she had an innovation budget of 3 billion dollars at her disposal for FinTech and other technology projects in 20166[97].

Banks are also using investment funds to stimulate FinTech companies and to learn from these new parties. In July 2014 Santander launched the Santander InnoVentures fund which is worth 100 million dollars to enable the bank to ride the wave of disruptive FinTech innovation[98]. By doing so, Santander has signalled its intention to support the digital revolution so that Santander's clients across the globe can benefit from the latest knowledge and innovations. The fund is part of Santander's broader innovation agenda. ABN AMRO also recently set up the *Digital Impact Fund* worth 10 million euros which it wants to use to attract and collaborate with the FinTech companies[99].

[89] *Level 39*
[90] *Startupbootcamp*
[91] *Startup Accelerator Wells Fargo*
[92] *BNP Paribas launches FinTech accelerator innovation.*
[93] *Barclays Accelerator*
[94] *Nordea Accelerator*
[95] *Innovation studio*
[96] *Innovation Economic Eindhoven*

[97] *Let's talk payments*
[98] *Santander innoventures*
[99] *ABN AMRO Digital Impact*

Cooperation between banks

Of course banks regard innovation, through the adoption of new technologies or the acquisition of or cooperation with FinTech, as an ideal way to put themselves ahead of competition. Nevertheless, there are a number of themes on which banks could take action together in order to benefit from new technologies and FinTech. Examples have already been given in the previous section. These examples can be categorised into three clusters:

(1) The dialogue of the banking sector with society, for example on the use of data and the impact of that use on privacy and security.

(2) The dialogue with legislators and regulators and supervisory authorities. For example, with regard to their task regarding informing clients in the light of the increasing diversity of financial services offered. The dialogue with legislators, regulators, and supervisory authorities must also focus on setting up the preconditions for a healthy innovation climate for both new parties and established banks (e.g. the regulatory sandbox to encourage experimentation, new light permit systems and tailoring supervision to activities rather than to entities).

(3) Projects which banks can undertake collectively in the interest of their clients in the field of innovation. Examples are blockchain experiments for Dutch retail clients and the setting up of a KYC utility.

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