



# Banking in Luxembourg

Trends & Figures 2020

Unless stated otherwise, all information used and presented in this publication relates to the data provided in the CSSF's 2019 annual report and in the individual annual accounts of legally independent banking companies (e.g. S.A.s and S.C.A.s). As there is no publication requirement, it was not possible for us to carry out an analysis of the data in the annual reports of legally dependent branches that are not recognised separately. In case banks have changed country segment, the previous year figures are adapted accordingly in both country segments. Therefore, previous year figures may vary from the figures disclosed in the previous year version of this brochure. The values used and calculated have been rounded up or down as appropriate.

Annual accounts reported in a different currency (USD/CHF) were converted at the exchange rate on the relevant closing date.

To accommodate the differences between Lux GAAP and IFRS, we have depicted these banks' balance sheet and income-statement data in a schematic representation that we use with Lux GAAP, and have therefore presented a number of assumptions in a simplified manner. The main assumptions are the following:

- The unused risk provisioning presented pursuant to IFRS has been deducted on a pro rata basis from loans and advances to customers and credit institutions;
- Financial instruments valued at fair value through profit or loss (transferable securities and derivatives) have been assigned to the "bonds and other transferable securities or other assets/liabilities items" item in accordance with the notes to the annual accounts available to us;
- Derivative fair values from hedge accounting have been assigned to the "Other assets/liabilities" item;
- The revaluation reserve has been added to "own funds";
- The profit or loss from financial instruments valued at fair value through profit or loss, as well as the profit or loss from hedge accounting, have been assigned to "Other net income" by virtue of their financial character;
- The profit or loss from financial fixed assets has been assigned to the "credit risk provisioning" item insofar as it relates to unrealised profit or loss components. Realised components, where identifiable, have been assigned to "Other net income".
- The figures presented have been established on the basis of internal calculation methods and may vary from the calculations shown in the individual annual accounts. The choice and classification of companies and the determination of the total number of banks per country segment were made based on internal data and on statistics published by the CSSF.

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# Foreword



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Located in the heart of Europe and home of 127 banking institutions from all over the world with a range of varied business models, Luxembourg has truly become an international financial centre. Whereas the majority of the banking institutions are from other European countries, Luxembourg has also proven a viable gateway to the European market first for banks from America and more recently for banks from China.

Our annual banking review takes an analytical view at this diversified banking landscape, aiming at identifying the major innovation trends within the Global and Luxembourg banking industry.

The current financial services environment is evolving rapidly, and global banking groups are taking a variety of approaches to transform and remain competitive. The first part of this year's edition of the "Banking Trends & Figures Brochure" covers an analysis of global banking innovations. We have considered innovations both on a geographical level and on a client-type base, and in order to draw meaningful conclusions we have categorised the innovations into seven broad categories. Within these categories we then present the most important trends.

The largest category is customer experience, with almost a quarter of all the innovations. We also noted that banks are striving to perfect their banking apps so as to satisfy fast-evolving client needs. With this perspective in mind, virtual assistants and the use of biometric data are seen as key transformative channels.

Sustainable finance is another area of innovation where banks have not missed out and several initiatives focus on this theme.

Considering Luxembourg's importance as a financial hub for Asset Servicing and Private Banking services, we offer two sections entirely dedicated to these two sectors. In addition, we found that globally more than a third of all the innovations were launched in partnership with a start-up or a fintech company. Thus, in the final section we describe the key role played by partnerships on the path towards innovation, providing significant examples.

As in previous years, in our publication "Banking in Luxembourg – Trends and Figures", we have categorised the banks according to their country of origin and analysed the financial statements of the six largest country segments of banks present in Luxembourg. The review also reflects on the diversity of the local banking community and illustrates the dynamics within the different country segments as well as their relative development against the overall Luxembourg banking market.

In order to ensure comparability and continuity we have kept the composition of the six main country segments. Our analysis, therefore, covers the country segments of German, French, Swiss, UK/North American and Chinese banks alongside with Luxembourg banks, which are part of the "home segment". For each of these segments we highlight changes compared to the previous year and discuss observed trends.



On the one hand, 2019 has been marked by new banks entering the market, some with radically technology driven business models. On the other hand, there has been further consolidation, with many banks transferring their business to their Luxembourg branches. Furthermore, there was a drive of large international banking groups transferring a substantial part of their activities from the UK to Luxembourg as part of their preparations for Brexit. Many banks were able to profit from the strong performance of financial markets in 2019, gained new customers and increased lending, as the low interest environment has led to a surge in business and mortgage loans.

The Luxembourg banks continue to exercise a relatively diversified business model in their home market, with a focus on private, retail and corporate banking as well as asset servicing. In comparison to this, the other country segments remain focused on one or two main business areas along the themes of investment fund servicing, depositary banking, private banking, (international) loans business or trade financing. The segment remains the largest and had a strong year, achieving the highest profit across the six segments with EUR 0.6 billion (+20.9%).

The UK/North American segment remains focused on asset servicing, such as rendering custodian, fund administration and transfer agent services. The UK/North American segment leveraged the continuing

growth in the Luxembourg investment fund industry and some major banks completed the move of assets to Luxembourg as preparation for Brexit, leading to the highest growth in total assets across the six segments (EUR + 27.2 billion; + 43.7%). The increase in the net commission income from these institutional asset-servicing businesses (+35.1%) was somewhat outweighed by increasing costs for staff and administrative expenses incurred during this strong growth year that led to a small decline of net profits (-4.7%).

The group of Swiss banks in Luxembourg also have a focus on asset servicing, as well as a tradition of private banking. Additionally, the advantage of the EU passport for the cross-border distribution of financial services is a key factor in making Luxembourg a location of choice for all non-EU banks.

The Chinese segment is characterised by Chinese banking groups establishing their European hub in Luxembourg and, by extension of business activities, into the EU via an extended branch network.

The French segment follows a model of universal banking with a focus on private banking, asset servicing and lending and represents the second largest country segment in terms of number of banks. The French segment has recorded another year of stable growth in total assets (EUR +4.6 billion; +5.7%).

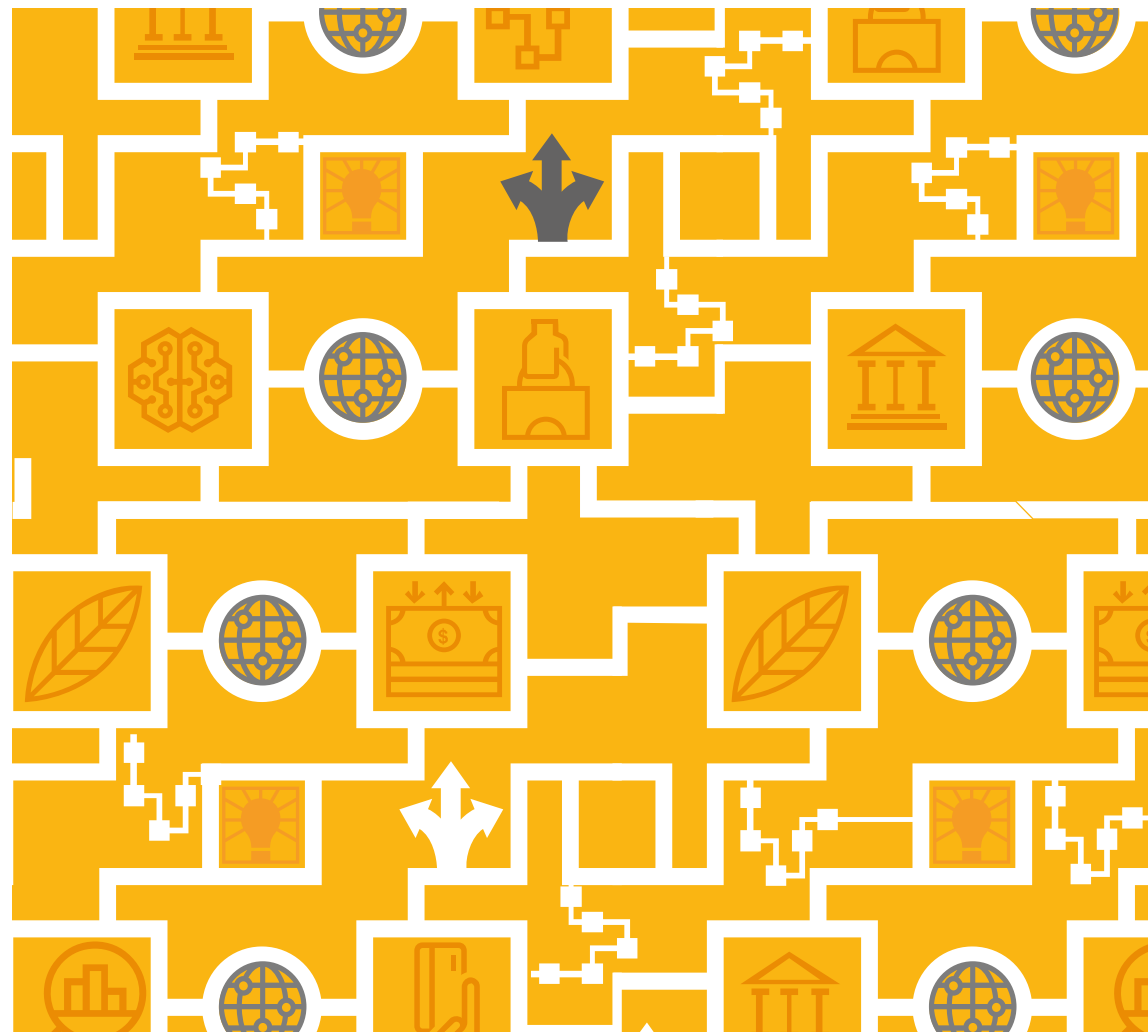
German banks offer a large variety of services that range from private banking via asset services to lending business. They also specialise in covered bonds with all two covered bond banks in Luxembourg having German origin. German banks were able to lower their costs this year, but lower banking income and increasing consolidation with banking business transferred to branches drove down total assets and net profits.

Our analysis of the 2019 annual accounts of Luxembourg banks provides once more an insight into the ever-growing diversity of the Luxembourg financial centre and illustrate the dynamics taking place in a fast-changing financial services world.



# 1

# Innovation in Banking





## Adapt or Die: What are the world's top banking groups doing to stay ahead?

Driven by new digital competition, the rise of sustainable finance, omnichannel client expectations and new technologies, banks face a crucial moment: adapt or die! Many have begun to adapt to the new ecosystem and deliver superior client experiences, but in order to go further, banks must bring constant innovation to the forefront.

So, what lessons are there to be learned from those banks that have successfully reached the top, and the innovations they are instituting in order to stay there? PwC has sought to answer this question by combining and carefully analysing public information from the following top players:

- **Top 50 Banks** worldwide by total balance sheet<sup>1</sup>,
- **Top 25 Private Banks** worldwide by assets under management<sup>2</sup>,
- **Top 30 Fund Administrators and Transfer Agents** in Europe by assets under administration<sup>3</sup>,
- **Top 20 Banks in Luxembourg** by total balance sheet<sup>4</sup>.

In doing so we believe that we have been able to generate a clearer picture of the way in which leading banking groups are using innovation to stay ahead. Seven broad innovations categories emerged:

- **Customer experience**
- **Capital markets and lending activities**
- **AI and analytics**
- **Payment solutions**
- **Sustainable finance**
- **Blockchain and crypto-assets**
- **Non-traditional banking services**

For each we drilled down into the most important trends and developments.

1. The Banker's Top 1000 World Banks 2019

2. Scorpio Partnership Global Private Banking Benchmark 2018

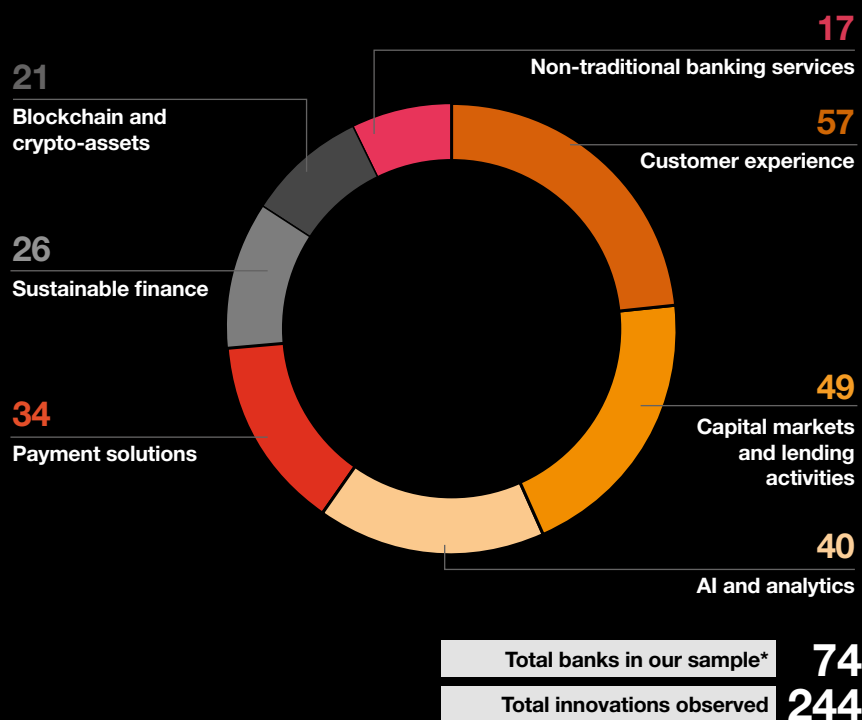
3. PwC Market Research Centre analysis based on Lipper by Refinitiv

4. Luxemburger's Wort, Classement des banques 2019



Additionally, we also looked at innovation specifically in the Private Banking and Asset Servicing sectors. Finally, we carefully observed the increasing trend of partnerships in order to achieve successful innovations.

### Innovation categories



But a simple list of what leading banks are doing holds little value without insight into the reasons why, and how, they are intending to use their innovations. In order to extract this critical understanding, we have guided our research through four key questions:







1. How does innovation differ across countries and regions?
2. What are the most apparent trends in innovation?
3. How are private banks and asset servicers innovating?
4. Are the innovations developed within the banks, or in collaboration with strategic partners?

Through this analysis we will reveal the inner workings, strategies and patterns behind some of the most successful banking groups across the globe. It will also provide deeper insight into the role of innovation as a means of maintaining success, as well as set a standard that could help other banking groups develop their own innovative strategies.

In the “Innovations observed” panel at the end of each category section, readers will find examples of the most representative and frequent innovations, which were independently launched by multiple banking groups. The information provided regarding each particular innovation has been taken directly from publicly available press releases and, as a result, some insights may be limited.

\* Banks for which we found at least one innovation from publicly available sources

# Key findings

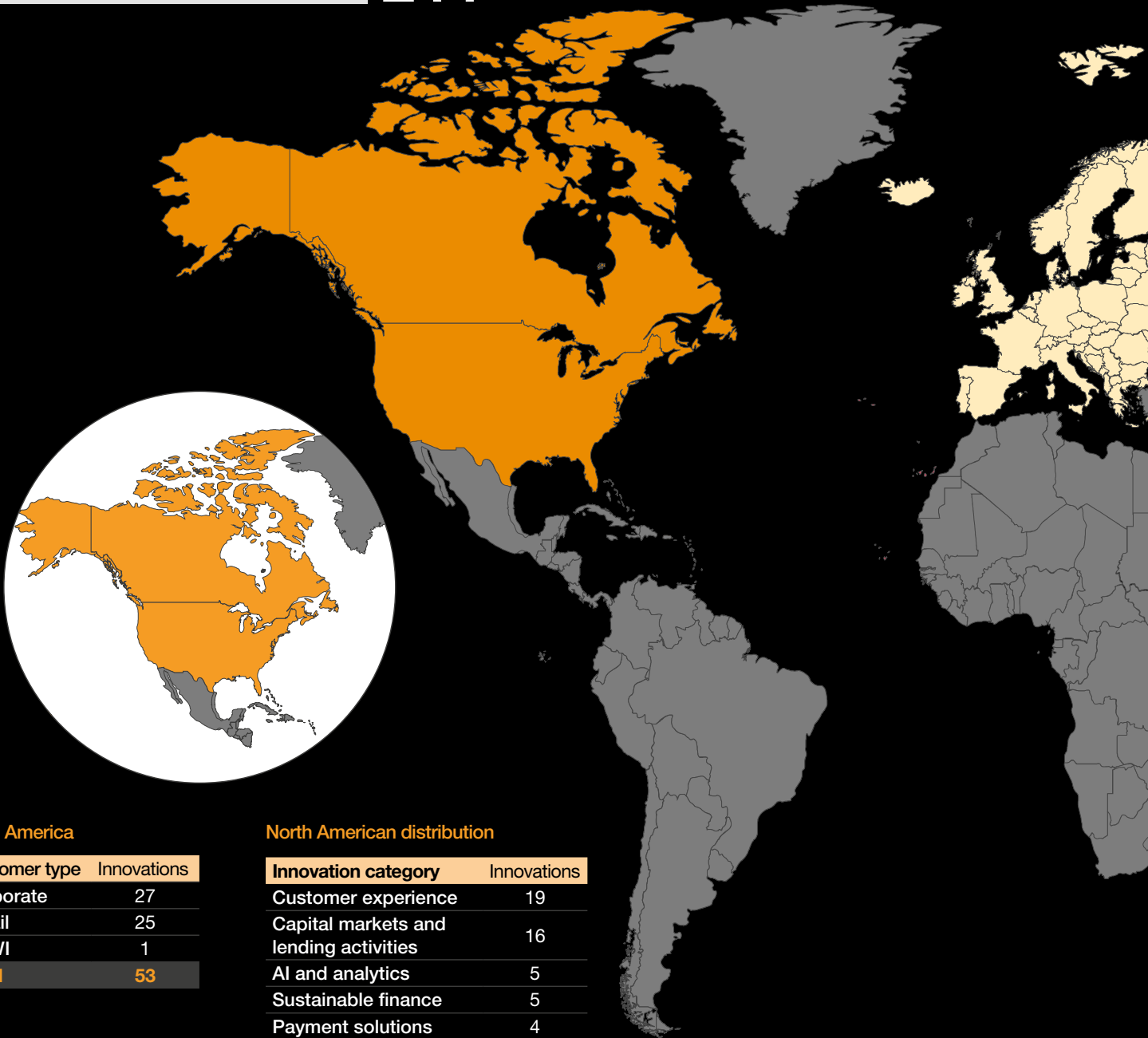
	<p><b>Attempt to develop the perfect mobile app</b></p>	<p>Mobile app development is the leading area of bank innovation. These applications assist customers in a wide range of areas, from budgeting to financial mentoring, or integrate different services into a single platform. Some examples of such services are housing, travelling, insurance and car services.</p>
	<p><b>Large-scale use of biometric data</b></p>	<p>Fingerprints, eye scans, facial recognition and finger vein scans have been combined with high technology to offer identity verification at a level that banks had previously only dreamed of – with applications to online payments, ATM withdrawals and transactions between banks. Many bank innovations have integrated the use of biometric data with mobile apps.</p>
	<p><b>“Conversational banking”</b></p>	<p>Using the latest artificial intelligence and data analytics, banks are able to connect more fluidly with clients. Mass distribution channels are suddenly able to provide personalised information through the use of virtual assistants, using chatbots and machine-learning algorithms. They also allow for effective response to client requests in real-time.</p>
	<p><b>Strategic partnerships</b></p>	<p>An increasing number of banks are realising that innovating in partnership with tech companies, startups and fintech boutiques prompts the creation of more effective and efficient solutions. By taking advantage of shared knowledge and talent, the costs of innovation are also often far less expensive.</p>
	<p><b>Sustainable finance</b></p>	<p>Policy makers have clearly announced their intention to use the capital markets to divert financial flows into the financing of sustainability and climate-change-related projects. The EU action plan with its widespread regulatory measures, such as disclosure regulation and EU taxonomy, will drive the change from the regulatory side. On the customer side, banks are recording a significant increase in demand for products that make a positive contribution to ecological and social challenges.</p>
	<p><b>SME solutions</b></p>	<p>A large number of innovations are tailored towards the small and medium enterprise sector. Solutions include toolkits that support the automation of internal processes and assist in the management of working capital. Additional products include access to industry specific insights and resources.</p>



# Overview of innovations across geographies

Total banks in our sample **74**

Total innovations observed **244**



## North America

Customer type	Innovations
Corporate	27
Retail	25
HNWI	1
<b>Total</b>	<b>53</b>

## North American distribution

Innovation category	Innovations
Customer experience	19
Capital markets and lending activities	16
AI and analytics	5
Sustainable finance	5
Payment solutions	4
Non-traditional banking services	2
Blockchain and crypto-assets	2
<b>Total</b>	<b>53</b>

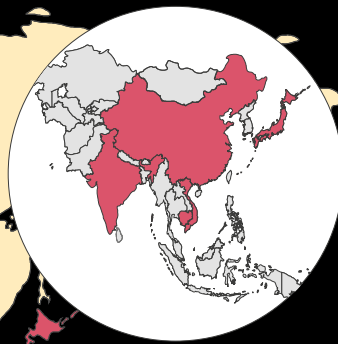
### Western, Central and Eastern Europe

Customer type	Innovations
Corporate	62
Retail	57
HNWI	13
<b>Total</b>	<b>132</b>



### Western, Central and Eastern European distribution

Innovation category	Innovations
Customer experience	31
Capital markets and lending activities	26
Sustainable finance	18
AI and analytics	17
Payment solutions	16
Blockchain and crypto-assets	13
Non-traditional banking services	11
<b>Total</b>	<b>132</b>



### Asia

Customer type	Innovations
Corporate	32
Retail	23
HNWI	1
<b>Total</b>	<b>56</b>

### Asian distribution

Innovation category	Innovations
AI and analytics	18
Payment solutions	14
Capital markets and lending activities	6
Customer experience	6
Blockchain and crypto-assets	5
Non-traditional banking services	4
Sustainable finance	3
<b>Total</b>	<b>56</b>

### Australia

Customer type	Innovations
Corporate	2
Retail	1
<b>Total</b>	<b>3</b>

### Australian distribution

Innovation category	Innovations
Capital markets and lending activities	1
Customer experience	1
Blockchain and crypto-assets	1
<b>Total</b>	<b>3</b>



Geography	Number of banks
Western, Central and Eastern Europe	37
North America	18
Asia	17
Australia	2
<b>Total</b>	<b>74</b>

# Customer experience



## The Client is King: Customer experience

High consumer satisfaction is the primary differentiator in the banking industry, with direct linkages to many crucial competitive advantages: higher recommendation rates, increased up-selling and cross-selling possibilities, and a stronger brand.

Banks need to decide what customer experience they would like to offer, whether they be mobile apps, increased internet based functions and offerings, or physical solutions. One route is the combination of an app for 'standard services' and personal channels for more sophisticated services (e.g. wealth planning). Some banks offer a bundle of 'fit for purpose' apps (e.g. trading) or bundle lifestyle and external services (e.g. concierge, insurance) into their existing banking apps. Most banks are choosing digital solutions, but often have limited digital talent. This is where the possibilities of partnerships come in.

Tech and fintech companies are usually far more tech savvy than banks and more agile since they do not need to operate through layers of banking bureaucracy and legacy core systems. They often already have tech solutions that can be easily adapted to successfully launch a new banking innovation, or are able to develop a new solution from scratch in a far shorter time frame. Partnering with these companies offers a simple way in which banks are able to meet many of the ever rising customer expectations.

### BUDGETING AND PERSONAL FINANCE MANAGEMENT AREA

Clients are searching for full banking solutions that provide not only the standard, but also deep dive into personal financial management. Digital solutions that banks have begun to provide include apps that use personal client data to create monthly budgets, track spending habits, and provide advice about saving in specific areas.

Other solutions are able to create the projected costs associated with having children. Applying advanced analytics and AI to cross reference personal client information with that from customers who have had children, projections become specific to the individual client. The beauty of this system and the use of advanced analytics and AI, is that the more a client uses the solutions, the more personally accurate they become.

Corporate solutions include systems designed to simplify the management of travel expenses within corporate policies. Virtual cards can be used by employees to automatically capture travel expense receipts for use in internal expense reports.





## ENHANCING BANK COMMUNICATION WITH CLIENTS

Technologies enable a client to be connected 24/7 and in a time where instant gratification is the norm (i.e. on-demand streaming on Netflix, same day delivery by Amazon, etc.), banks must up their communication game. Furthermore, given the current reality of restricted physical movement and social distancing due to COVID-19, communication via virtual reality and augmented reality can play a critical role.

Preserving client relationships during this period has already led to an increase of virtual meetings. These are likely to become more established and more prevalent in the future. Banks in Europe have already set up branches with 5G connections, 4K high-definition videoconferencing hardware and software, along with low-latency cloud-storage and virtual reality.

There is also a clear trend becoming apparent within bank's attempts to streamline a digital product offering that combines the videoconferencing products with the chatbot innovations discussed in the previous section. Interestingly, the use of these innovations is also linked to how tech-mature the banks clients are, and China is the standout leader. The integrated platforms that are developed allow banks to communicate with clients in real-time while maintaining compliance and governance policies.

Banks are also looking to improve better physical interaction with clients in their branches with the development of social humanoid robots. The robots provide customers with information regarding new products, banking options and self-service possibilities. By using chatbots, they are able to ask relevant questions in order to determine client banking needs. In a time of social distancing, the use of these robots constitutes a viable alternative to in-person interactions in bank branches. Such social humanoid robots have been deployed in Asia, Europe and North America.

## IMPROVING THE WORKING CAPITAL MANAGEMENT PROCESS

Banks are increasingly looking to create new technological applications to ease the working capital management process of SME's and large companies. The reasoning is simple: keeping the customer happy by improving their banking experience.

Innovations revolve around solutions for the automation of working capital and more generally the optimisation of payments. These often involve identifying the most efficient payment channels for hundreds, and even thousands, of receipts. SME solutions include innovations that streamline multiple payment requests and automated reminders, analytics solutions that collate data from various accounting and payroll sources, and provide better financial perspectives.

Other SME solutions involve support and expertise in digitising the financial supply chain, providing cloud-based solutions for collateral and margin management, decreasing delays and friction, and allowing suppliers to benefit from improved access to capital.





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# What do we observe in Luxembourg?

## ENHANCING EMPLOYEES' WORK EXPERIENCE TO IMPROVE CUSTOMERS EXPERIENCE

Customer experience starts with high operational efficiency and good employee experience. This is why we observe many banks in Luxembourg exploring innovations that aim to improve the overall experience of their workforce through a process of digital transformation. The solutions that have been implemented tend to focus on the concept of a 'digital workplace' and involve the use of cloud-based applications, remote working and digitisation of processes. The "Design Thinking" management strategy is another trending approach in the banking sector and has been applied by local players in order to promote creativity and further innovations. An example of this might involve a local bank conducting a series of interviews with the workforce, along with management, so as to better delineate their ideal working conditions. The first step aims to understand which working activities need to be improved and, as a second step, the employees define the elements that would considerably improve their working experience. Interestingly, these initiatives that seek to promote a better working environment have been accelerated by the COVID-19 crisis. Levels of investment in this direction have consistently increased, and operational changes previously planned to occur in years have instead been put in place in a matter of weeks.

## HOW LUXEMBOURG BANKS APPROACH THE CUSTOMER EXPERIENCE

Digitisation plays a key role in the customer experience dimension within the local banking industry. A typical example is the simplification of the loan application process to finance a project. Most local banks have updated the procedure and have moved all the steps online, enabling clients to receive approval for a loan in just 24 hours, without the direct involvement of the bank's workforce. In addition to the increased quality and simplified experience perceived by clients, with these solutions banks have also gained advantages in terms of cost reductions and improved operational efficiency. Many other initiatives go in the "Omnichannel Banking" direction and, adopting a client-centric perspective, banks are putting in place the internal processes to be able to follow-up on clients requests across all channels – web, phone, and branch.



Total innovations observed **57**

Innovations observed

 Bank	 Application	 Client	 Product	 Description
<b>RBC</b>	Budgeting	Retail	NOMI	NOMI Budgets is an application that recommends an appropriate budget for customers and sends timely updates to help keep them on track in a seamless and convenient way. One of the features of NOMI Budgets is the suggestion of a personalised, monthly budget across five key areas – entertainment, shopping, cash withdrawals, transportation and dining – comparing changes in level spending against previous months.
<b>BNP Paribas</b>	Communication with clients	Corporate / HNWIs	Meetings in augmented reality	BNP Paribas is launching smart branches with the possibility for its clients and employees to engage in teleport-based meeting in five locations: Hong Kong, Dubai, London, Frankfurt and Paris. Each location will be equipped with a wearable spatial computer, to conduct collaborative meetings remotely. In concrete terms, customers will be able to benefit from meetings with the bank's global advisors and experts in augmented reality in different continents.
<b>Bank of America</b>	Working capital management	Corporate	Business Advantage 360	Business Advantage 360 is an app that allows small businesses to view and connect data from third-party accounting, analytics and payroll applications with an integrated perspective, providing in this way a more complete financial picture. Since the launch, more than 1 million Bank of America business owner clients used the platform. Business Advantage 360 received Aite Group's 2019 Impact Innovation Award in Cash Management and Payments for Customer Experience for Small Businesses.
<b>Barclays</b>	Financial Mentoring	Retail	Barclays Money Mentors	Barclays Money Mentors is a service that provides independent guidance, designed to help answer financial questions and clear up money concerns. Barclays Money Mentors service is available nationwide and is open to everyone, not just Barclays customers. The personalised 45-minute mentoring sessions can be booked online, to take place in branch, by video or over the phone.
<b>Commonwealth Bank</b>	Industry Insights	Corporate	Vonto	Vonto is a mobile app that provides personalised insights and ideas to keep small businesses moving in the right direction. The app collects data from a range of regularly used business tools into one platform, and provides easy to understand and actionable insights.
<b>Rabobank</b>	Verification services	Corporate	SurePay	SurePay delivers an account check to financial institutions, who can implement the service in their online environment. At the pre-payment stage, the service provides the bank's customers with instant feedback on the correctness of entered beneficiary details when making a transfer online. That way, end-users are prompted with a notification in case entered beneficiary details deviate from those known at the bank of registry. This helps to prevent fraud and mistakes.

# Capital markets and lending activities



## Strengthening the Core: Capital markets and lending activities

As regulatory barriers that hampered the entrance of new players into the banking industry are lowered and changed, a wave of new entrants and fintech companies are disrupting the market and setting whole new paradigms. Banks are ensuring they remain competitive by harnessing new technology to boost their core business activities: the lending process, investment products and trading services.

Looking at lending activities, there is increasing competition in the Peer to Peer (P2P) and SME segments, with banks offering a number of innovative products. Contesting this space are both financial and non-financial service providers, with competition being fierce and more options available to customers than ever before. Banks are also being pushed to offer the user-friendly experiences made available by fintech solutions. The innovations noted in this area are designed to enhance the customer experience by dramatically reducing the time required to process loan applications, and are able to offer personalised solutions.

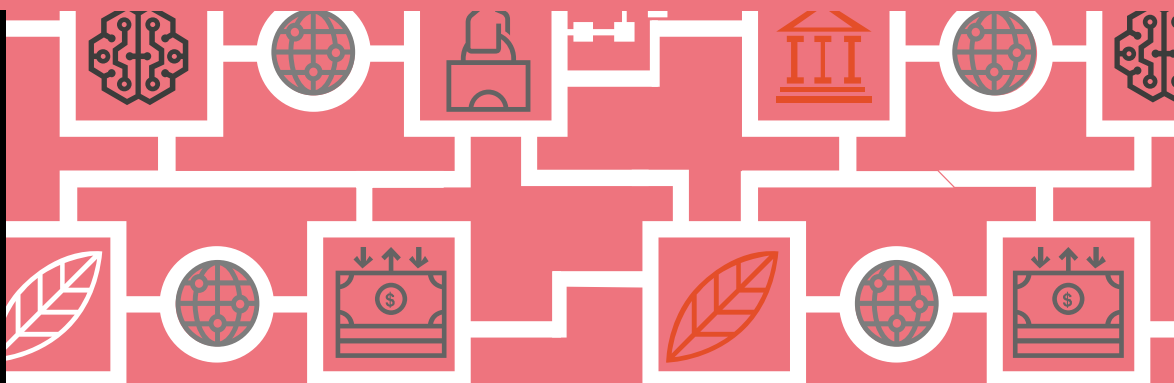
In terms of investment and trading services, the innovations banks are putting in place are primarily evolutionary in nature, and not specifically new products. These innovations aim at integrating solutions that are already in the market, refreshing their existing platforms with new features, and expanding their range of investment products.

### SIMPLIFICATION OF THE LENDING PROCESS

Most banks are innovating and modernising the process of customers applying for a loan. The simplest way to begin the process is by offering online platforms that allow for the application to happen fully online. Features of these online platforms also offer real-time tracking of the application process. In some cases it may be enough for the customer to provide collateral information online, with which the bank will conduct an online assessment and credit approval. This way, banks are able to dramatically reduce the time needed to approve a loan.

However, the greatest innovations related to the process of customers applying for loans revolve around the use of AI and analytics for performing creditworthiness checks. As discussed in the next section of this chapter, the use of machine-learning algorithms and AI to generate accurate loan assessments has proven to be a game-changing technology. Algorithms are now able to produce (or reveal) more precise insights in a few minutes rather than several weeks of traditional investigation, and they can be applied to companies as well as retail clients. Small business lending platforms can approve loans in minutes, providing a faster and more convenient way for small businesses to obtain working capital.

The main source of concern for many banks in this sector is the competition for customers, which has been exacerbated by the arrival of alternative service providers, particularly fintech companies. Complex legacy systems cause traditional banks to have slow operating processes, and this is not a problem that fintech companies have. As a result, they can create new products and services much faster than traditional banks, and are also able to adapt far quicker to market changes. This situation is forcing the traditional banks into innovating their lending processes by automating where possible and cutting operational costs. In an environment of low interest rates and shrinking margins, it is becoming increasingly important that banks adapt to this technological shift.



## ENHANCING THE INVESTMENT PROCESS AND TRADING SERVICES

The modernisation and simplification of the investment experience is a constant challenge for banks. Mobile investment applications have become a must-have. There are two main types of customers for investment services: those who trade self-directed and those who expect to receive investment advice or even have their portfolio fully managed. Thus, banking apps increasingly offer facilities to track markets and trade directly. These apps include several different features ranging from client portfolio analysis, portfolio construction and risk management to behavioural finance content, simplified decision-making tools and solutions providing exposure to thematic investment through ETFs. Other apps might feature personalised financial advice by suggesting investment products that best fit with the customer's investment profile, and in accordance with their personal circumstances and goals.

Investors are increasingly expecting banks to be proactive by anticipating their needs and providing support in areas that do not necessarily fall within the scope of traditional banking, but in associated fields. An interesting example of this type of innovation relates to banks facilitating the establishment of investment vehicles in foreign countries by offering web-based solutions to international investors, asset managers and insurance companies. The solution provides guidance with regard to completing prescribed documentation, advice with the relevant know-your-customer (KYC) requirements, and even extending to support for financial advisors in building, managing and marketing their own investment strategies.

Banks are also using technology to make trading and markets more accessible by reducing barriers to entry and improving the quality of their trading services. Other areas of innovation relate to the expansion of their trading platform features, as well as the use of blockchain technology. An increasing number of customisable execution algorithms, integrated across several asset classes, are also being made available. All of these innovations are being used to provide clients with enhanced levels of control and transparency in order to better manage their exposure through improved trade analytics, deep pools of liquidity for each asset class, and innovative solutions for accessing that liquidity.

# What do we observe in Luxembourg?



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## A FOCUS ON CORPORATE TREASURY SOLUTIONS

Most of the innovations in capital markets and lending activities implemented in Luxembourg aim at improving operations and user experience for both SMEs and large corporate clients. A large number of innovative projects have been launched in the development of cloud-based solutions and in the area of electronic bank account management (EBAM) systems. Other innovative projects involve the automation of anti-money laundering (AML) processes. All of these new services have been requested by clients over the years. Special focus has also been given to providing better support for corporate treasurers. Indeed, Luxembourg constitutes an attractive centre for treasury and corporate finance activities and as the role of treasury and its needs transform, so have banking solutions.

The automation of FX derivatives is a representative example of local initiatives in this direction. A large, local bank has recently entered into a commercial agreement with a fintech company in order to improve client experience around foreign exchange risk management activities. The partnership will enhance the use of FX derivatives targeting both SMEs and large companies. The new service provides a link between the bank and the client's enterprise resource planning (ERP), which allows customers to automate the taking of derivatives for daily hedges. With this partnership, the local bank intends to offer corporate treasurers an improved hedging service and enable clients to focus on more strategic hedges. The agreement represents a further example of the banking attitude towards transformational initiatives and may soon be followed by other Luxembourg banking groups.

## CHALLENGES AND FUTURE OPPORTUNITIES

The Luxembourg banking sector has several challenges ahead. Connectivity issues are one of them and they are particularly felt by local banks in the expansion of their services to nearby countries. Smaller players have experienced difficulties in defining and agreeing on common protocols and formats to use. To overcome this situation, local banks need to fully embrace the technological upgrades available to enhance their core business areas and exploit the possible competitive advantages. Banks should undertake a path of targeted digitisation and also take the necessary steps in the automation of operational activities. This digitisation should aim at preventing the dislocation of key business areas to countries offering a cheaper labour force. The emphasis should be on solutions first developed in Luxembourg rather than those already implemented in other countries. Moreover, the importance of Luxembourg in the fund industry represents a source of opportunity for the banking sector too. While the traditional fund industry is slowly consolidating, the alternative investments fund industry is developing fast and may offer benefits to local banking groups. Opportunities are arising due to many players in the alternatives industry being old-fashioned and lacking the requisite technical operational capabilities. Cyber risk represents another area where Luxembourg banks could offer innovative solutions, with branches of global banks that are already offering risk management solutions in this area.

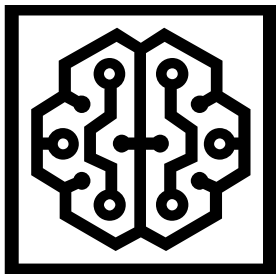


Total innovations observed **49**

Innovations observed

 Bank	 Application	 Client	 Product	 Description
<b>Banco Santander</b>	Lending process	Corporate	Financia&Go	Financia&Go is the first 100% digital invoice financing service for SMEs and freelancers. This service allows SMEs and the self-employed to access and contract financing directly from their own billing and accounting platforms, without the need to access the online banking portal. With Financia&Go, Santander facilitates access to short term financing from the customer's own invoice management tool.
<b>Société Générale</b>	Trading	Corporate	SwapScale	SwapScale is a cloud-based application used by Société Générale as a new swap trading and management system. The platform is provided by Nuvo Prime and will be implemented in Société Générale's prime brokerage business. It combines swap and cash prime finance position-keeping, financing and reporting on an integrated technical infrastructure.
<b>ING Group</b>	Investment process	Corporate	Katana	Katana is an advanced analytics platform that supports portfolio managers in making faster and sharper investment decisions in the bond markets by using computational power and machine learning algorithms.
<b>Scotiabank</b>	Lending process	Retail	eHOME	eHOME is a unique digital mortgage experience that modernises how Canadians can get a mortgage. With this solution, Canadians can apply for a mortgage completely online, track the application status through real-time updates, and complete the closing with a lawyer, without requiring an in-person appointment with a mortgage specialist or financial advisor.
<b>J.P. Morgan</b>	Trading	Retail	You Invest	You Invest is a new U.S. digital investment platform offering all customers 100 commission-free online stock and ETF trades, as well as the opportunity to earn unlimited commission-free trading. Already live, You Invest is available within the Chase and J.P. Morgan mobile apps and websites, including Chase.com, the most visited banking portal in the U.S. You Invest makes it easy for both new and experienced investors to get and stay invested.
<b>BBVA</b>	Investment process	Retail	BBVA Invest	BBVA Invest is an app that provides personalised financial advice by suggesting the investment products that best fit each customer's investment profile, in accordance with his or her personal circumstances and goals. Each year the customer's personal circumstances are reassessed in order to determine if a change of investment strategy is necessary.





## Rise of the Machines: AI and analytics

Banks in the corporate, private and retail sphere are creating innovative new solutions and applications to client needs that might have come across as bizarre science-fiction less than 20 years ago. Among the technological areas that banks are focusing on, Artificial Intelligence (AI) and analytics play primary roles. These new technologies are impacting nearly every level of banking, and in so doing generating greater efficiencies in cost and time, as well as better served customers. They are also enabling banks to make pertinent decisions around extending credit and providing levels of transactional security that were previously unthinkable.

### APPLICATION OF AI AND ANALYTICS TO DOCUMENTS PROCESSING

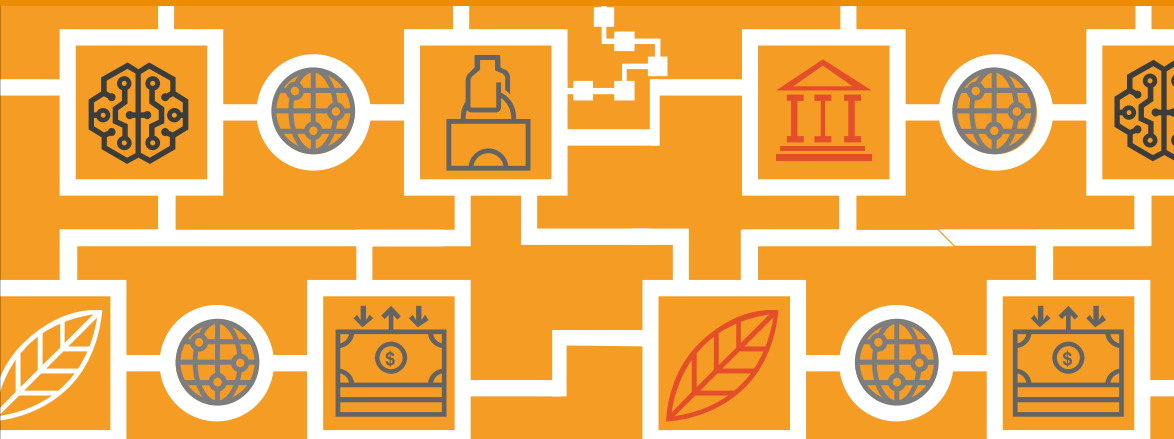
The use of AI and analytics tends to apply to innovations concerning document processing, virtual assistance and credit assessments. In terms of document processing, there are significant cost savings to be had by applying AI and analytics tools to the systematic automation and optimisation of repetitive tasks. Bank executives have noted three particular areas in which they are focused when looking for AI and analytics innovation: regulatory compliance, fraud detection, and cloud-based legal document systems.

Looking further into how banks are using AI and analytics to process documents, we have noticed innovations that are targeted at a three-step process of digitisation. This involves streamlining the digitisation of physical documents, the updating of digitised documents, and the seamless retrieval of previously scanned documents. Another key area of innovation concerns the use of AI in processing and categorising large data volumes of hand-written documents and non-standard forms. This is a particularly useful application of technology as the traditional process is very time-consuming and highly expensive.

### VIRTUAL ASSISTANTS AND THE CONCEPT OF CONVERSATIONAL BANKING

While the term 'chatbots' might conjure up images of gossip-hungry robots, the voice-based technology behind them is becoming increasingly influential. Amazon's Alexa shows just how far the AI and analytics technology has progressed, and banks are creating their own virtual assistants in order to help their clients with a range of services. This 'conversational banking' provides personalised customer service through real-time answers and insights into a range of financial issues. Various chatbot innovations are able to provide simple information such as balance enquiries and spending patterns, as well as far more complex functions such as investment simulations. All the information is gleaned from personal client profiles and preference data, and by making use of client feedback, the individual client model becomes more refined with each interaction.





## APPLICATION OF AI AND ANALYTICS IN THE CREDIT ASSESSMENT PROCESS

The use of AI and analytics in credit assessment processes presents one of the most important, high-value applications of technological innovation for banks. By applying AI and machine-learning algorithms to social data, banks are able to better assess repayment ability and creditworthiness of customers. However, the algorithms and AI are limited by the quality of the data publicly available. Wherever anomalies are detected, or inconsistent values are found in lower quality data, the technology will highlight issues for further investigation.

Another key feature of AI innovations regarding credit assessments is that when they are applied directly to models, they allow for the discovery of relevant relations that traditional models cannot capture. These expansive abilities, when combined with machine learning algorithms, allow for the creation of predictive models that reduce risk and can unlock credit to businesses and individuals faster. As a result, the significant opportunity of being able to make instant short-term digital credit becomes possible.

But beware, credit risk modelling is one of the most highly regulated areas in banking, and new models need to obtain authorisation from the financial regulator. In order to move past this hurdle, banks must be able to demonstrate a total understanding of how their 'black box' algorithm works to the regulator. This is likely the most challenging aspect of gaining regulatory approval and takes time and significant experience to achieve. Once again the issue of employing highly-skilled talent becomes apparent.

## AI TO ENHANCE FRAUD PREVENTION

With the disruptions coming from digital technologies, banks and financial institutions are becoming more and more exposed to financial fraud. Nowadays, cyber criminals investigate multiple channels so as to obtain sensitive client information for use in illicit activities. Smart players are therefore increasing their efforts and investments in solutions that prevent all forms of financial crime and mitigate the risk of fraud. Innovations using AI and analytics offer banks effective tools to improve transactions' security and to quickly identify money laundering, fraud and terrorist financing attempts. The adoption of machine learning models to mitigate the threat of fraud is growing fast, and offers the additional advantage of cost reductions. As an example, some decision intelligence platforms provide a comprehensive customer overview, empowering the bank's investigators to make faster and more accurate decisions.

# What do we observe in Luxembourg?



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Strategy to Operations,  
Digital Smart Identity,  
Biometrics,  
Senior Manager,  
PwC Luxembourg

## AI – EARLY STAGE DEVELOPMENTS

In 2019 PwC conducted a survey<sup>1</sup> with the aim of understanding where Luxembourg companies stood in terms of data analytics and AI. The companies in the sample came from a wide array of sectors and sizes, providing a representative view of the local situation. The results of the survey highlighted how more than 23% of the respondent companies were using AI solutions. In 2020 that number has increased to 33%, while the percentage of companies that are willing to experiment with and adopt AI has reached 75%. In Luxembourg, the main reasons for the deployment of AI are operational efficiency, client knowledge, user experience and performance improvement. Among the broad spectrum of solutions involving AI applications, document classification is becoming more and more popular. However, the application of conversational banking bots is still lacking. Their adoption is slowed down by the number of languages used in Luxembourg.

## THE ROLE OF ANALYTICS TOOLS

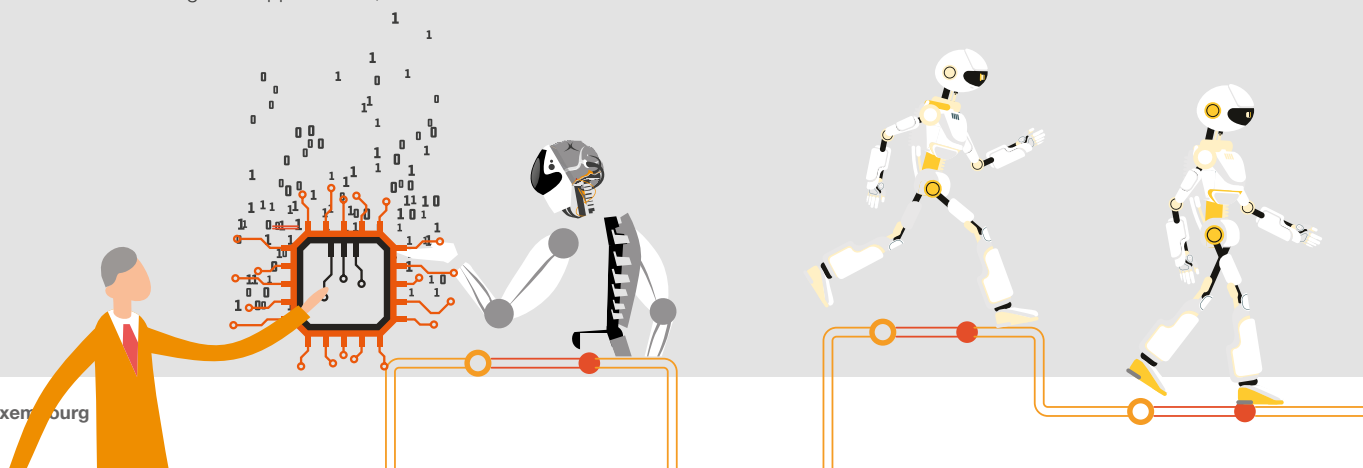
We have also observed a positive trend of Luxembourg banks in terms of adopting and investigating analytics platforms that are able to leverage the latest AI solutions. New analytics tools are not intended to get rid of the current work procedures, but are considered as an augmentation that initially coexists with the current set of tools. Galytix is supporting major banks in automating credit processes and developing innovative credit risks modelling. This grants these players an exhaustive view on the monitoring of their counterparty risks once a loan has been granted. It gathers information from different systems, synthesizing the analysis into a single view using AI. Banks highlight that these tools need to be made available to the whole company and used by employees at all levels of the organisation, and not only technicians. Luxembourgish banks are increasingly looking for diverse professional profiles that can properly manage new data-driven tools and are establishing new management roles. Also, according to last year's PwC report, among the new data-processing positions, the data protection officer and data analyst positions are the ones that have most openings. Additionally, an important finding was that Luxembourg banks should start to proactively consider how to optimally use the data they collect every day instead of waiting for innovation to trickle down from their headquarters.

## CHALLENGES AND FUTURE OPPORTUNITIES IN AI

One of the most important challenges in Luxembourg is the human factor; according to last year's survey, 63% of respondents considered the lack of knowledge and skilled workforce the primary constraint when approaching AI. The second, critical obstacle companies face when introducing AI pertains to the financial dimension: it is difficult to have a clear estimate of the expected investment return and the financial resources needed to start an AI project. Moreover, large banks' R&D centres in charge of AI development are often domiciled abroad and Luxembourg branches and subsidiaries are not active participants in the development of new solutions. However, the local regulator is playing an active part in fostering the adoption of AI technologies and in the definition of new standards and practices. At the end of 2018, the CSSF, the Luxembourgish financial market regulator, released clear guidelines concerning the use of AI in the banking sector and provided industry specific examples<sup>2</sup>. These guidelines have helped to consolidate interest in bank's making use of AI.

1. PwC, 2019. Use of Data Analytics and Artificial Intelligence by Luxembourg companies.

2. CSSF, 2018. Artificial Intelligence: opportunities, risks and recommendations for the financial sector.

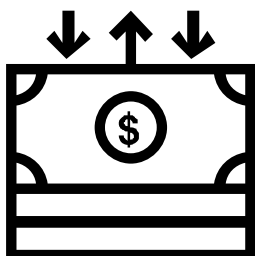


Total innovations observed **40**

Innovations observed

 Bank	 Application	 Client	 Product	 Description
<b>Mizuho Financial Group</b>	Documents processing	Corporate	The AOR	The AOR is a AI-based solution introduced in 2019 for the automation of data processing. The solution is designed for hand-written documents and non-standard forms and derives its name from the usage of artificial intelligence (AI), optical character recognition (OCR), and robotic process automation (RPA) technology. Thanks to modern algorithms that accurately interpret character information, manual data-entry was reduced by approximately 80%.
<b>Toronto Dominion Bank</b>	Virtual assistant	Retail	TB Clari	TB Clari is a new chatbot integrated into the bank's mobile app that provides customers with real-time insights about their personal spending and helps them manage everyday transactions. TD Clari provides clients with quick answers to their banking questions and helps with many common account-related activities.
<b>ING Group</b>	Credit assessment	Corporate	Early warning system	The early warning system (EWS) helps credit risk analysts make quicker and more informed decisions and results from the partnership of ING with Google and PwC. The EWS is an AI-powered application that collects and analyses large amounts of data to identify whether clients are exposed to potential risks, a task traditionally performed manually by risk analysts. EWS elaborates real-time market data and publicly available information, processing up to 80,000 articles every day thanks to the use of Google's natural language processing and translation services.
<b>ICICI Bank</b>	Credit assessment	Retail	PayLater	PayLater is a product similar to credit cards that gives short term digital credit, instantly. The service is available 24/7 and uses ICICI Bank's new Big Data based algorithm for undertaking credit assessments of customers to verify their creditworthiness. Based on the eligibility of the customer, the Bank offers up to 45 days interest-free credit limit ranging from Rs. 5,000 to Rs. 20,000 based on the eligibility of the customer.
<b>China Industrial Bank</b>	Documents processing	Corporate	RPA robots	The bank launched several robot products including credit robots, customer service robots, financial reporting robots, and others, that aim to provide solutions for digitisation and the improved efficiencies in front, middle and back-end processes.
<b>CaixaBank</b>	Virtual assistant	Retail	Neo	Neo is a personal Customer Service assistant (available 24/7) that helps customers across several processes, like contracting, operational (such as balance inquiries and monthly expenses) and resolution. By using this new chatbot function, it is estimated that the use of the CaixaBank instalment payment service will grow by some 15%. The chatbox aims to cover all type of conversations and can communicate in English, Spanish and Catalan. The results of the project include a 20% reduction in calls to the contact center and a positive feedback rate of 85% where no further engagement is required.

# Payment solutions



## Is Cash still King?: Payment solutions

Clients do not want to worry about payments, they want to tap and go. Mobile innovations lie at the core of most payment innovations, making full use of the increased abilities of mobile technology. These mobile payments are accelerating in several dimensions, including security, faster execution, and lower transaction fees. But, there are still significant barriers to ensuring the full potential of these payment platforms are made broadly available. These bottlenecks are usually associated with emerging markets, and their lower levels of smartphone ownership, as well as poorly coordinated cross-border payment systems.

### EXPLOITING BIOMETRIC DATA

The safe and accurate identification of clients wishing to perform payments on mobile devices has been advanced incredibly. This has been achieved by the great strides made in the use of algorithms and the technology to manage them effectively. The increased use of facial recognition and fingerprint scanners are quickly making the use of passwords and PIN codes obsolete. Innovations such as biometric bank cards that incorporate fingerprint sensors require banks to collect the biometric data of clients and to compare them with data collected in national records in order to confirm authenticity. Once the face scans and fingerprints have been verified all types of payments can be streamlined through ATM's and mobile devices.

A technological step up from fingerprint scans are finger vein scans, which are considered to be far more secure for transaction approvals. As with facial recognition and fingerprints, finger vein scans are able to provide fast and secure access to banking facilities. They also eliminate the risks involved with remembering passwords and PINs, as well as PIN capture, identity fraud or the sharing of account details.

However, it is imperative that the storage of large volumes of customer's biometric data is handled very sensitively. There are real privacy, data security and cyber risks involved and the theft, leakage or loss of any of this information has the potential to cause serious reputational damage and as a result must be managed properly.



## INNOVATING THE WAY CUSTOMERS PAY ONLINE

The use of smartphones to make payments and transfer money has become common practice, and banks are continuing to improve this method of payment by making it ever more intuitive and efficient. For those banks that are looking to provide additional features onto their mobile payment apps, the first step to take should be to enable the fast, direct transfer of money between banks by addressing issues of the identification process. This is made possible through the use of email addresses and mobile phone numbers that can reduce the time it takes to verify identity to a few minutes. A second option are the possible benefits of integrating the payment process. An example might be the cooperation with national healthcare authorities to launch mobile payments via electronic certificate. As a result, it would smooth the process for patients, hospitals and healthcare security administrations.

Other options to enhance the mobile apps include the use of banking-as-a-service (BaaS) platforms and the use of QR codes. The first of these makes use of API<sup>1</sup> to provide services across the entire payment chain to financial sector companies. The second option, QR codes, allow customers to intuitively make payments, send and receive transfers, and perform other financial transactions all on their smartphones.

## ALTERNATIVE PAYING METHODS

Banks are constantly on the lookout for the next game-changing alternative payment method. As a result these innovations represent a wide array of diversity. Some innovations in this area revolve around using WeChat QR code scanning to complete payments and transfers through smartwatches and wearable devices. Other solutions involve payment terminals which include new tools such as aggregated payment codes, smart payment cloud speakers and code scanning boxes. A major focus of innovation is in the area of smart point of sales (POS). By using a smartphone, tablet or other smart device, sellers are able to replace the traditional cash register or electronic POS terminal.

In taking account of the success, and the associated technology, of Amazon Go, some banks are providing apps that are able to make automatic payments with a mobile checkout and without having to wait in line to pay at the exit. This can be done through scanning of items with a smartphone camera.

Credit cards are also being seen as a prime point of innovation by the banking industry, particularly in the US. Virtual credit cards that work with facial recognition, which allow for quick applications and approvals, are becoming popular, as are credit cards with no visible numbers or codes. This results in an increase in security levels in online and mobile shopping. These numberless cards are able to reduce instances of fraud by up to 90%.

1. API = Application Programming Interface



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 Financial Services  
 Automation,  
 Director,  
 PwC Luxembourg

# What do we observe in Luxembourg?

## LUXEMBOURG, A HUB FOR PAYMENT SOLUTIONS

The payment landscape in Luxembourg has long been dominated by a limited number of players. In the past years, the Grand-Duchy financial centre has been able to attract many international Payment-Service-Providers (PSPs) and specialised innovative start-ups that created a unique ecosystem for financial innovations. Since 2018, 11 new electronic money and payment institutions have been granted a license by the CSSF in order to operate in Europe. These enterprises originate from countries such as China, Japan, USA, Germany, UK, Belgium, Italy, Greece or Luxembourg. The growth registered by these new businesses is the reason for the significant increase in the volume of transactions managed by Luxembourgish banks. Following the new Payment Services Directive (PSD2) legal framework, which fosters the competition across the European Economic Area (EEA) and will become fully effective by end 2020, this trend will likely strengthen even further. Under these new rules, more and more online payments will be subject to Strong Customer Authentication (SCA) requirements with the objective of increased transaction security.

## CORE AREAS FOR INNOVATION

In Luxembourg, the payment area that is receiving most attention is the use of biometric data in the verification process. Banks are investigating new applications with the purpose of improving security and offering better client experience; for example with mobile wallet applications. Some European banking groups are using their Luxembourg branch to drive innovation in the payment area, due to a combination of two primary factors: the strictest standards in terms of payment regulation, as well as a pragmatic approach from the regulator. An important element to highlight is the position of the financial regulator concerning new solutions and paying methods. In this regard, the CSSF has proven to be open to discussion and strongly promotes a practical, innovative approach, stressing that new solutions should concretely transform and positively affect the financial industry.

## CHALLENGES AND FUTURE OPPORTUNITIES IN THE PAYMENT AREA

The main challenge within Luxembourg banks is their ability to integrate innovations within old legacy systems. Some systems may be so old that the initial investment to replace existing solutions or integrate new ones actually jeopardizes attempts at innovation. It is therefore crucial for banks to anticipate possible discrepancies and technical problems that may arise between the core system and the new innovative payment solutions. The second main issue concerns the skillset necessary to deploy payment solutions. Technical knowledge is not enough and must go along with a practical business approach. In this context, young people in managerial roles play a key part and are the force driving the adoption of new solutions. This is in line with what we currently observe in the market: an increase in the diversity of profiles searched by banks, with the end goal being a change in their management approach.



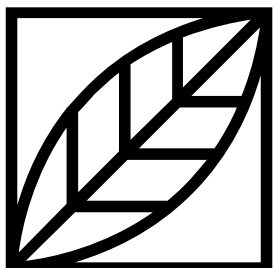


Total innovations observed **34**

Innovations observed

 Bank	 Application	 Client	 Product	 Description
<b>Mizuho Financial Group</b>	Online payments	Retail	J-Coin Pay	J-Coin Pay is an application that employs QR codes to provide smartphone-based payment services. It enables customers to make payments, send and receive transfers, and perform other financial transactions all on their smartphones. Customers will also be able to use the smartphone app to move funds between their J-Coin Pay accounts and their deposit accounts at their financial institutions without additional costs.
<b>ING Group</b>	Alternative paying methods	Corporate	'Tap on Phone'	'Tap on Phone' is a pilot application by ING and Mastercard being tested by 200 businesses in Istanbul. The 'Tap on Phone' application allows business owners to use their Android smartphone, tablet or other smart devices as mobile points of sale (POS), replacing the traditional cash register or electronic POS terminal. ING is the first bank to pilot a software-based 'tap on phone' solution. The app is ideal for smaller businesses without a traditional checkout counter or for businesses with low transaction volumes which are often on the go.
<b>Banco Santander</b>	Credit card	Retail	Numberless credit card	Santander Mexico has launched a credit card for its customers that has no visible numbers or codes. The numberless card increases customer security for online and mobile shopping, since it helps reduce the risk of fraud by up to 90%. Only the name and expiry date of the plastic card are displayed. Therefore, customers do not reveal sensitive data and are better protected from the possible theft of information on a physical card. The digital card works with a dynamic CVV and a personal identification number (PIN), thereby creating a new security environment.
<b>ING Group</b>	Automated payments	Retail	FINN - IoT automated payments	FINN is a solution that enables smart devices to perform autonomous transactions. Setting a new standard in Internet of Things (IoT) payments, FINN's software allows consumers to keep control over their smart devices by allowing them to make secure (micro)transactions on their behalf. With this, FINN helps companies to offer 'pay-per-use' solutions and to enter the IoT space. It combines bank security protocols and known payment methods in one service, and offers it open source to IoT companies, a first in the IoT landscape.
<b>Société Générale</b>	Online payments	Retail	Treezor	Treezor is one of France's pioneering Banking-as-a-Service platforms that provides services across the entire payment chain through API to many innovative financial sector companies. Treezor provides real-time access to core-banking systems, payments, KYC and a personalised card program. Over the past two years, Treezor grew to manage up to €3 billion in transaction flow annually and issued 300,000 payment cards. Societe Generale will be able to reduce Time to Market when developing new services for its clients, supported by the innovative and agile system of Treezor.
<b>Crédit Agricole</b>	Biometric	Retail	Biometric credit card	Crédit Agricole is experimenting with biometric bank cards. Crédit Agricole is conducting a six month trial with the biometric card, which incorporates a fingerprint sensor. Users who wish to do so will be able to make any payment by simply placing their fingerprint on the fingerprint sensor on their Crédit Agricole biometric bank card.





## Growing client concern: Sustainable finance

The concept of sustainability has grown to become a globally recognised topic, which has produced a groundswell of support both among the general public and corporations alike. At the same time, the regulator has developed a new regulatory framework, the “EU Action Plan on Financing Sustainable Growth”, which is further promoting and supporting action in this field. The possible synergies between regulatory compliance and strategic positioning in the field of sustainable finance are motivating the banking industry to be at the forefront of this transition and to put in place measures that mitigate environmental concerns, climate change and social issues. These are implemented both in their own operations, as well as in the investments they make. Increasingly, banks are taking an active part in addressing these concerns both in defining new financial industry standards, and in the integration of these social and environmental standards into their traditional business models. Banks are increasingly recognising their responsibilities and are showing growing commitment to new ideas, technologies and partnerships focused on environmental and social impact projects: in this context the EU Action Plan provides a relevant framework and the tools to leverage this incredible opportunity to doing well while doing good. In this section we provide a few examples of the latest, and some more remarkable, initiatives.

### GREEN FINANCING

We are entering a new era in sustainable finance, where innovation is coming from all corners of the markets and transforming how companies operate and investors allocate capital. Environmental concerns are growing all over the world, with increasingly large numbers of customers demanding global actions, and the role of the financial industry is coming more and more under intense scrutiny. The main reason for this scrutiny is due to the banking industry’s primary function being resource allocation. As a result banks are introducing innovative approaches to raise capital. Initiatives include the introduction of green bonds which finance selected environmental projects, climate impact investments for wealthy clients and carbon offsetting platforms.



## SOCIAL FINANCING AND SOCIAL INITIATIVES

Social impact investing is another area for sustainable innovations, and banks are offering a range of solutions that enable customers to directly finance projects, designed to have positive impacts on communities. Direct investments can be made into cities and communities around the world that have not felt the benefit of meaningful economic growth, as well as making use of new platforms to support entrepreneurs starting social projects.

A number of these new platforms merge social lending with donations and are dedicated to non-profit organisations that wish to start a social project involving a broad community of active donors. Other banks make their contribution through the publication of regular articles concerning social challenges that may be particularly appropriate to clients, and provide investment solutions that may address those issues across public and private markets.

However, banks are increasingly taking a more proactive approach with regard to social initiatives and are in fact conceiving of, and implementing, social projects of their own accord. The common goal is to provide solutions adapted towards social entrepreneurship and promoting positive social change. One of the ways in which banks have been able to do this is through the creation of platforms that actively empower citizens and communities. A wide array of platforms have been created addressing issues such as promoting women in business, providing insights into the financial services industry, and showcasing career opportunities in business, finance and technology. Yet another area of focus is the creation of online platforms which allow communities in a specific town, region, or even apartment block to freely interact with neighbours and friends, solve community problems and share ideas addressing community issues. Included in a few of these community platforms is the possibility to pay rent and public utilities.

# What do we observe in Luxembourg?



**Daniel Theobald,**  
Sustainable Finance  
Consulting,  
Senior Manager,  
PwC Luxembourg

## A LEADING INTERNATIONAL CENTRE FOR SUSTAINABLE FINANCE

Already at the end of 2018, with the government publication of a roadmap for sustainable finance<sup>1</sup>, Luxembourg strengthened its position as an international centre of excellence in sustainability. Nowadays, it is a recognised primary location for the listing of green bonds with a 50% market share, and as a European leader in terms of assets allocated to responsible investments within funds. The government has already taken early action to support sustainable development in the Grand Duchy by developing a framework called “Luxembourg 2030 - National Plan on Sustainable Development”, which transposes the global UN 2030 Agenda into a national program to foster prosperity, environmental protection and social inclusion. Local banks are therefore at the frontline of sustainable finance. This has been confirmed by the results of a survey<sup>2</sup>, performed by ABBL with the support of PwC. The study aimed to receive answers from banking CEOs in Luxembourg for both the current stage of development and the upcoming relevance of sustainable finance. One particular innovation worth mentioning has been the local development and implementation of the green covered bond. In 2018, Luxembourg was the first country in the world to define a legal framework for this new financial product, which is considered an evolution of traditional green bonds.

## THE CHALLENGES ON THE PATH TOWARDS SUSTAINABILITY

The way banking groups approach sustainability is through a regulatory compliance perspective. To meet new regulatory requirements, they need to understand the legal framework and the taxonomy, which is a classification instrument to help determine which activities are classified as sustainable. The adjustments to the product portfolios triggered by the taxonomy require an adjustment of the strategic parameters and objectives. This opens up the discussion on developing a holistic, strategic sustainability approach that goes beyond Sustainable Finance. There is indeed much more going on and depending on the position the bank wants to have in the market, sustainability should be considered in every banking area and function. In order to succeed, banks have to overcome the data challenge and understand which data sources they can rely on, ensuring that ESG data flows are correctly integrated in current IT systems and establishing ESG KPIs to effectively measure future advancements. The critical factor necessary to succeed in all these steps is clearly knowledge, both of sustainability issues and of client’s needs. As such, there is a need to educate not only employees, but also customers.

## OPPORTUNITIES TO LOOK AHEAD WITH OPTIMISM






Recently, the European Commission has released a legal framework which includes a comprehensive taxonomy which will be fully finalised in 2022/2023. Some other regulatory requirements, however, will be applicable much sooner, such as the Disclosure Regulation that will apply as of March 2021. Despite putting some pressure on banks, this new regulatory framework is pushing them to commit beyond what is required and to pursue long-term goals. This is a great opportunity for Luxembourg to establish its own framework in line with the EU directives, pushing sustainable finance initiatives and consolidating its international relevance as a green financial centre. The recent Memorandum signed by the European Investment Bank (EIB) and the International Climate Finance Accelerator Luxembourg (ICFA) promoting environmental investments in Europe and beyond constitutes a major step in that direction. Moreover, zero interest rates, the COVID-19 crisis, narrow margins and low revenues from credit portfolios are forcing banks to focus more on profitability and consider alternative sources of income. From the client’s side, there is a strong demand for ESG products and sustainable finance definitely represents a valid and profitable new business opportunity.

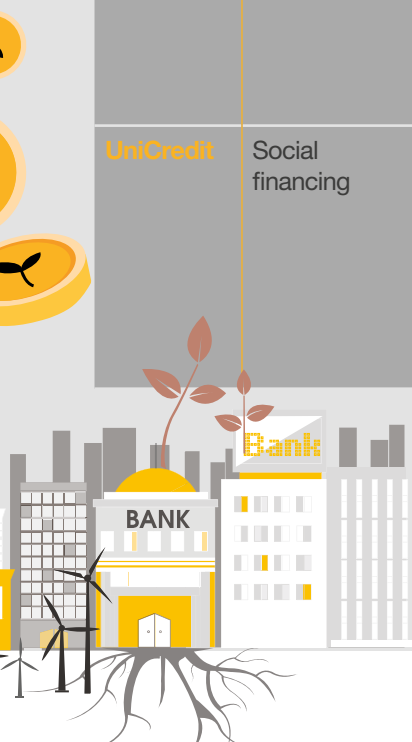
1. UNEP FI, 2018. Luxembourg sustainable finance roadmap.  
2. ABBL, 2019. ABBL Sustainable Market Study - CEO pulse survey



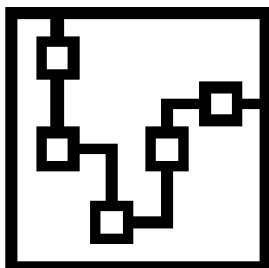
Total innovations observed **26**

Innovations observed

 Bank	 Application	 Client	 Product	 Description
<b>BNP Paribas</b>	Green financing	Corporate	ClimateSeed	ClimateSeed is a voluntary carbon offsetting platform that links organisations with sustainable initiatives with the objective to avoid carbon emissions. The service provides a wide range of internationally certified projects including reforestation, energy efficiency and renewables. It is BNP Paribas' first social business targeting climate action, supported by Nobel Peace Prize Laureate Prof. Yunus.
<b>BNP Paribas</b>	Green financing	Corporate	ClimateSeed	ClimateSeed is a voluntary carbon offsetting platform that links organisations with sustainable initiatives with the objective to avoid carbon emissions. The service provides a wide range of internationally certified projects including reforestation, energy efficiency and renewables. It is BNP Paribas' first social business targeting climate action, supported by Nobel Peace Prize Laureate Prof. Yunus.
<b>Crédit Mutuel</b>	Social financing	Retail	Donations through ATMs	Crédit Mutuel has launched the first donation operation activated on ATMs in France to benefit a health association. This innovative system has been tested in 2019 and will be gradually extended to the entire country in 2020. In concrete terms, any person, whether or not a client of Crédit Mutuel will be able, after inserting their bank card, to make a donation to the association or another entity by following the instructions in the main menu with a simple click on the machine.
<b>Mizuho Financial Group</b>	Green financing	Corporate	Mizuho Eco Finance	Mizuho Eco Finance is a service that has the objective to advance the shift to a low-carbon society. Through this service, Mizuho Bank will provide financing to clients who meet a certain minimum score based on the bank's scoring system, which utilises an environmental assessment model developed by MHIR to evaluate client initiatives and benchmarks via a globally accepted environmental verification and evaluation program. Through monitoring, MHIR will provide strategic advice to clients to improve and maintain their scores.
<b>UniCredit</b>	Social financing	Corporate	Social Impact Banking	The Social Impact Banking (SIB) initiative of UniCredit in Italy has approved € 72.9 million for impact financing. The initiative was extended on a gradual basis to other markets in which the Group operates in 2019. The SIB model fosters positive social impact and will be adapted in each market according to local needs. The proceeds will primarily be reinvested in SIB initiatives. The rest of the proceeds will be dedicated to other relevant projects, including the local support of young artists.



# Blockchain and crypto-assets



## The rise of blockchain and crypto-assets

Ever since the emergence of Bitcoin back in 2009, the concepts of blockchain and crypto-assets, and their inherent potential have been steadily gaining traction in the financial sector and other industries around the world. This has happened as both technologies have matured and misconceptions about them have begun to fade.

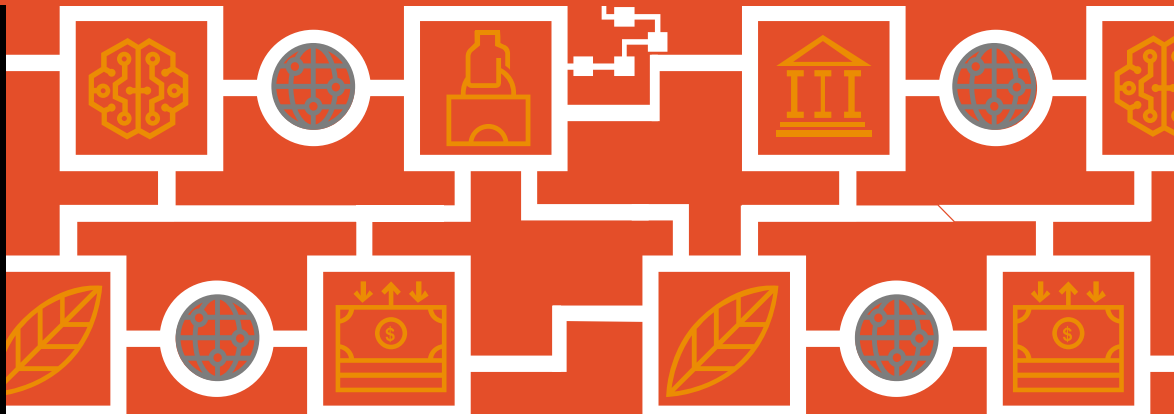
**Thomas Campione,**  
Blockchain & Crypto Leader,  
Director,  
PwC Luxembourg

At its most basic level, blockchain technology offers a fast and secure way of recording transactions, and to share them with the participants of a network. In addition, the technology provides transparency and traceability by allowing parties to independently monitor the various stages of a transaction value chain in real time. More precisely, blockchain is a type of digital, distributed ledger that can be used to manage financial transactions, such as cross border payments, international trades or capital markets issuances such as bonds and equities. Any of these transactions can be processed substantially faster than in traditional financial markets given the distributed nature of the technology, the inherent reduction of intermediaries and reconciliation processes it offers. Security is another outstanding feature of blockchain, achieved through embedded cryptographic elements.

Crypto-assets are digital representations of rights or value that are hosted and transferred through the use of blockchain, leveraging the benefits of this technology. It must be noted here that while crypto-currencies such as bitcoin are indeed part of the crypto-assets universe, they only represent a subset of it, namely those that are fully decentralised, and without an underlying, and proper, issuer. The range of crypto-assets is far broader than simply these crypto-currencies, and also includes tokenised assets such as private debts or security-like instruments for example.

As market developments show, crypto-assets are offering great perspectives that banks can use to improve the efficiency of many areas of the capital markets by offering enhanced fractional ownership, improved transferability and continuous trading for example. What we are currently witnessing is the development of digital market infrastructures and an appetite from institutional players to not only step into the use of blockchain and crypto-assets as drivers of cost efficiency, but also to transform the way they operate and develop new revenue streams.

The initial barriers to introducing blockchain and crypto-assets innovations are high in terms of cost and talent, but the early adopters are already reaping the benefits of their investments.



## TOKENISATION

Tokenisation is the process of digitally representing value or rights through the issuance of tokens that will be stored, transferred or redeemed over a blockchain based infrastructure. Any type of assets (tangible or intangible) or financial instruments and more generally speaking anything of value can be tokenised. The concept brings significant benefits such as enhanced fractional ownership, continuous trading and improved transferability, and liquidity, to name a few. However, tokenisation still faces the hurdles of many nascent concept such as a lack of regulatory clarity and relative standardisation, as well as under-developed digital market infrastructures. Despite these current limitations, which are being addressed and will be solved over time, tokenisation has the potential to disrupt capital markets as a whole, whether in the issuance process, which becomes accessible to any player irrespective of their size or existing market reach while becoming much more efficient and programmable, or the asset servicing value chain which gains efficiency, increased transparency and immediacy among others.

## CRYPTO-ASSETS CUSTODY

One of the peculiarities of the crypto-assets universe is that holders do not actually own their assets; what they effectively own is their private key which gives them access to their crypto-assets. Furthermore, in most cases, losing your private key means losing your assets, as there is no way to retrieve it. The safekeeping of these private keys is therefore an extremely important area which requires the highest standards in terms of governance, controls framework and security. The last few years have seen the emergence of significant crypto-players in this area, some of them have acquired regulated licenses or SOC<sup>1</sup> attestation in order to support the development of their businesses within institutional markets. More recently, traditional banks have stepped into this field and have leveraged their existing regulated status to seize new business opportunities and answer new clients needs. In the

near future, the combination of technical providers, traditional players' sound reputations and the development of the regulatory framework will be key enablers of massive market developments in the crypto-assets industry.

## CENTRAL BANK DIGITAL CURRENCY (CBDC)

The Facebook Libra initiative has been a catalyst for massive attention on the concept of stablecoin (a crypto-asset backed by fiat currency and fixing for the volatility issue known to be a problematic feature of decentralised crypto-assets) across supranational bodies worldwide. Indeed, this volatility issue has been, and still is, a barrier to many blockchain projects and the mass adoption of crypto-assets in financial services. Central banks across the globe understood the need and now more than 80%<sup>2</sup> of them are conducting research in the field. It is worth noting that there are two main types of CBDC, namely the wholesale CBDC and the retail CBDC. The former is a crypto-asset issued by a Central bank and used amongst financial institutions that have an account at the central bank. The latter is also issued by a Central Bank, but would be made available as a digital extension of cash by the general public as well as companies. These digital currencies may differ in their use and perspectives, but have in common massive improvements in both efficiency and effectiveness when compared to our current monetary system.

1. SOC = System and Organisation Controls

2. From the Bank of International Settlements (BIS) 2019





**Thomas Campione,**  
Blockchain & Crypto  
Leader, Director,  
PwC Luxembourg

# What do we observe in Luxembourg?

## LUXEMBOURG'S ECOSYSTEM AND REGULATORY LANDSCAPE

An interesting feature of blockchain, crypto-assets and related digital market infrastructures is that size doesn't matter and Luxembourg certainly confirms this view. With more than 50 players active in the field, from tokenisation platforms to crypto-exchanges, wallets providers and other financial service providers active in the country, Luxembourg has a burgeoning and very promising ecosystem that already positions Luxembourg as global player.

In addition, the Law of 1 March 2019, amending the law of 1 August 2001 (on the circulation of securities) recognises distributed ledger technology (DLT) as an authorised medium to hold securities accounts and register securities transfers. This has been the first and key step towards regulatory clarity, which is a primary enabler of market adoption. The new legal framework places traditional transactions on the same level as those carried out using distributed ledger technologies. Moreover, on 30th July, the bill of law 7637 proposing the recognition of DLT as infrastructure for issuance of dematerialised securities has been submitted to parliament and will complement the law of 2019 once approved.

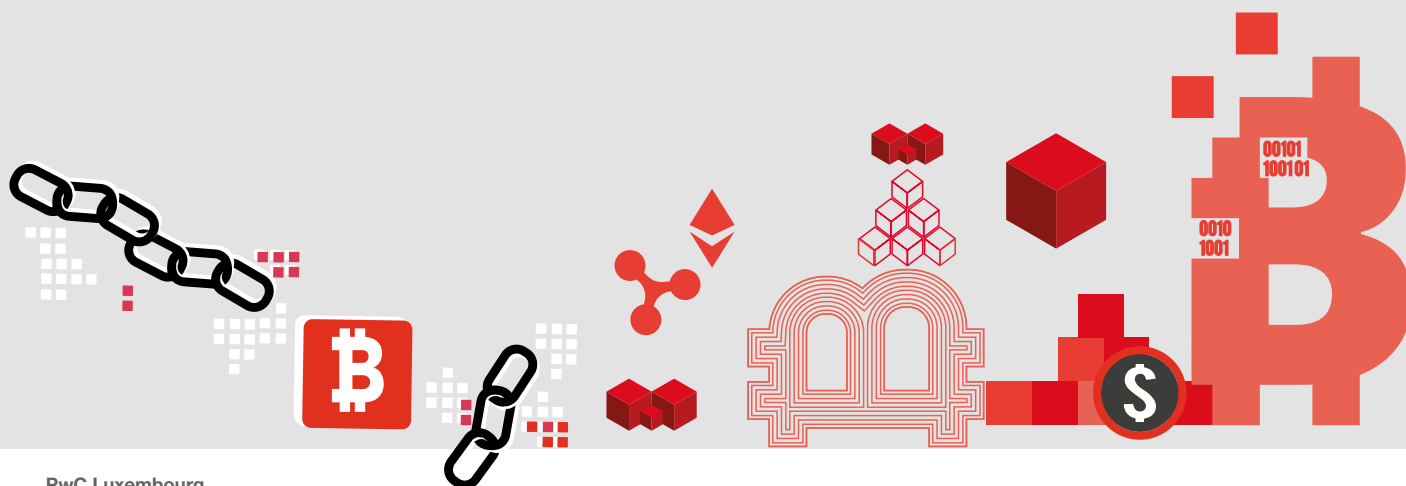
Now all eyes are on the EU regulatory framework whose proposal is expected later this month and the ability of the country to implement it efficiently to drive further development of the local ecosystem and strengthen Luxembourg's position as key player in Europe and beyond.

## CHALLENGES AND FUTURE OPPORTUNITIES

While blockchain and crypto-assets are not new anymore, they are still nascent topics from a mass market or institutional perspectives, and this clearly comes with a certain number of challenges.

First of all, there is a knowledge gap to fill, as these topics are complex, quite conceptual and also suffer from branding issues and misconceptions. Filling this gap and going beyond misconceptions will be a prerequisite to tackle the second challenge which is the investment gap. Blockchain & crypto-assets are transformative concepts which require organisations to rethink the way they operate, to transform their products and to reassess the way they interact with their stakeholders and customers. This not only requires a strong ability to reconsider things and to challenge the status quo but also a significant amount of investment, as is the case with any transformation program. Lastly, a blockchain and crypto-asset based business requires new skills, new profiles, new functions and even more the upskilling of existing management to drive it properly and in a sustainable way.

However, none of these challenges shall obscure the massive opportunities to seize and the fact that Luxembourg has a great opportunity to emerge as a very strong player in the blockchain and crypto-assets industry not only because of its growing ecosystem and the general innovative mindset of the country, but also through the extensive expertise that is being developed on major topics such as assets tokenisation or blockchain based AML/KYC solutions. In addition, the willingness from the financial regulator to engage with the market and to support innovate and sound projects can clearly be a catalyst for the positioning of the country in the coming years.

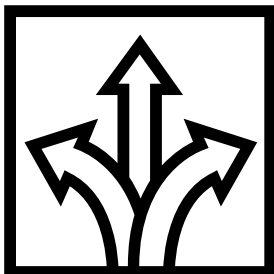




**Total innovations observed 21**
**Innovations observed**

 Bank	 Application	 Client	 Product	 Description
<b>BBVA</b>	Tokenised green bond	Corporate	N/A	In February 2019 BBVA issued the world's first Green Bond using blockchain. Two blockchains have been used, an internal permissioned one based on Hyperledger Fabric which enabled them to ensure investors eligibility compliance and the public Ethereum testnet to register the transactions, which allowed full transparency on the transactions.
<b>Société Générale</b>	Tokenised bond	Corporate	OFH Tokens	Societe Generale SFH, the covered bond vehicle of Societe Generale, issued €40 million of covered bonds as security tokens directly registered on a public blockchain. Rated Aaa by Moody's and AAA by Fitch, these OFH Tokens were fully subscribed by Societe Generale which simultaneously paid the issuer in a digital form of euros issued by Banque de France through a blockchain platform. This experiment was performed end-to-end using blockchain infrastructures, in accordance with best market practices.
<b>J.P. Morgan</b>	Payments	Corporate	JPM Coin	The JPM Coin is a stable coin pegged to the USD (1:1) and uses a home-made, private version of the Ethereum blockchain, named Quorum. It essentially enables real-time gross settlement between institutional clients. In its most basic form, the JPM Coin workflow involves the conversion of a client fiat currency amount into an equivalent number of JPM Coins which are used for transactions over a blockchain network with other JPM clients. These are ultimately redeemed for USD at which point the JPM Coins are burned. The entire process takes place in near real time.
<b>CaixaBank, Deutsche Bank, Erste Group, HSBC, KBC, Natixis, Nordea, Rabobank, Santander, Société Générale, UBS and UniCredit</b>	Trade finance	Retail	We.trade	The we.trade platform is a digital one-stop shop solution for trades built on Hyperledger Fabric. Leveraging blockchain features, all parties involved in a trade transaction are connected seamlessly. It provides both SMEs and banks with full transparency, trades tracking and paperless processes among others. The platform is live with 16 banks across 15 countries.
<b>ABN AMRO, BNP Paribas, Citi, Crédit Agricole Group, Gunvor, ING, Koch Supply &amp; Trading, Macquarie, Mercuria, MUFG Bank, Natixis, Rabobank, Shell, SGS and Societe Generale</b>	Commodities trade finance	Corporate	Komgo	Komgo is a blockchain-based commodity trade financing platform based on Quorum blockchain. The solution aims to optimise the whole flow of physical commodity operations and is connected to another live Ethereum platform, VAKT, a blockchain-based post-trade processing platform for commodities. The platform also has a proprietary document transfer system that allows secure transfer of data without revealing contents and a simplified client onboarding and renewal tool.

# Non-traditional banking services



## Venturing into new territories: Non-traditional banking services

Increasingly banks are looking to other sectors of the economy in order to offer their clients more value. These sectors include insurance and health, as well as property and motor vehicles. Like many of the other innovations in this guide, exceeding customer expectations and creating new avenues of income are the focal point of these non-traditional banking services. As you might imagine, due to the nature of these innovations there are no neat categories into which they can easily fit. Instead of discussing these non-existent categories, we will look into a number of the individual innovations and showcase the solutions they provide.

The first of these innovations is Toronto Dominion Bank's TD Wheels product. TD Wheels is an app that provides customers with the optimal vehicle and financing options suited to that individual, based on their personal data. It makes budgeting, financing and buying easy, and provides an estimate of monthly payments that customers may qualify for.

The next innovation of note is BBVA's corporate housing product Valora. Once again, the product is an app, but Valora takes a quite different approach to many other apps. Valora uses augmented reality to help prospective buyers and renters find a home. Users simply need to point their smartphone camera, using Valora View, at a building they might be interested in, and the app will automatically retrieve all the information available regarding any units for sale or rent in that building or the surrounding area. The app also provides additional information about the property and the surrounding neighbourhood.

Texas Capital Bank's Bask Bank is a digital savings account that earns American Airlines miles, instead of interest. This customer engagement initiative has the aim of providing customers with a goal-based savings account that rewards them with tangible benefits that most people want, such as travel, and in so doing differentiating themselves from purely financial players.

The final non-traditional innovation we will discuss is Idea Bank's Idea Hub Express. Poland's Idea Bank is taking mobile banking to a whole new level by converting carriages on intercity trains into co-working spaces. The Idea Hub Express carriages will be on select PKP Intercity trains and will feature regular office equipment such as desks, chairs, screens, printers and phone charging. The carriages will be open to every passenger holding a valid ticket, however, Idea Bank customers will have seat priority, with bank staff on hand to assist.



**Total innovations observed 17**

Innovations observed				
 Bank	 Application	 Client	 Product	 Description
<b>Toronto Dominion Bank</b>	Car	Retail	TD Wheels	TD Wheels is an app that suggests optimal vehicle and financing options available to the customer, and provides information about financing rates. It makes budgeting, financing and buying easy, providing an estimate of the monthly payments customers may qualify for.
<b>BNP Paribas</b>	Housing	Retail	Colivme	ColivMe is an online platform that aims to list all the co-living offers available in France. A forerunner in this high-potential market, BNP Paribas Real Estate wants to make ColivMe the reference for co-living professionals and individuals looking for a new lifestyle combining flexibility, services and community.
<b>BBVA</b>	Housing	Corporate	Valora	BBVA Valora is an app that uses augmented reality to help prospective buyers or renters to find a home. Valora View users simply need to point their smartphone camera at a specific building; the app then automatically retrieves all the information regarding any units for rent or sale in the building or the surrounding area. The app provides additional practical details about the property and the neighbourhood itself.
<b>Texas Capital Bank</b>	Customer engagement	Retail	Bask Bank	Bask Bank is a digital savings account that earns American Airlines miles instead of interest. This initiative has the goal to provide the costumers with a goal-based saving account that rewards them with tangible benefits that most people want, like travel, and in so doing differentiating from pure financial players.
<b>ABN Amro</b>	Housing	Corporate	Wooncontractgemak	Wooncontractgemak is a service for housing corporations to substantially simplify and automate the processes of housing applications and allocations. It offers prospective tenants access to a special app, which enables them to electronically submit large amounts of required information in a safe, swift and simple way. Wooncontractgemak then combines this data with other information to create a report that will then be reviewed by the housing corporation, speeding up and simplifying the proper allocation of social or private housing. Furthermore, the initiative's application reduces fraud and the burden of administrative tasks and enables prospective tenants to identify themselves with ease during contact moments.
<b>Idea Bank</b>	Customer engagement	Retail	Idea Hub Express	Poland's Idea Bank is taking mobile banking to the next level, turning carriages on intercity trains into co-working spaces. The Idea Hub Express cars will be on select PKP Intercity trains, featuring tables, chairs, screens and other office equipment such as printers and phone chargers. The carriages will be open to all passengers holding a valid ticket, but Idea Bank customers will have seat priority, with bank staffers on hand to assist.

# Special focus on Private Banking innovation

## A peek behind the curtain

### How HNW clients' expectations are driving Private Banks to innovate

As may be expected there is a clear lack of publicly available information regarding private banking innovation. There is no doubt that many innovations are happening, but these tend to only be communicated directly to clients or at invite-only events. However, there are a select few private banks that have openly communicated a few key innovations, and they make for interesting reading. Despite the opaque nature of private banking, there is a clear theme that comes across in the innovations recorded: the importance of meeting customer expectations in a highly demanding sector of the banking industry.

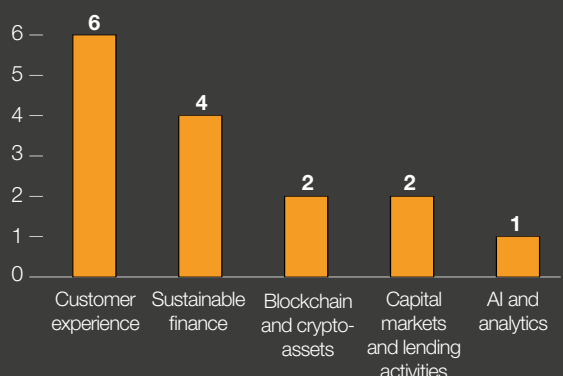
The needs and expectations of HNWI clients show that the importance of individual relations with personal bankers is a crucial aspect. The basis of trust, though, really is sacrosanct. As a result, many of the web and mobile based applications that have been featured in the preceding sections are not appropriate. The innovations, where information is available, tend to fall within five distinct categories: digital solutions that are able to enhance the face-to-face nature of private banking, access to social and environmental initiatives, the use of AI and analytics, blockchain and crypto-assets, and the capital and lending markets. A particularly interesting point is that of the 15 innovations found in this category, more than half (8) were developed in partnership with other firms.

#### CUSTOMER EXPERIENCE

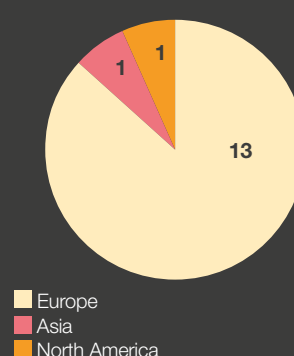
In terms of customer experience, the primary innovations involve the same types of innovations as made available through retail banks. Examples of products include advanced wealth management solutions, as well as luxury lifestyle services that seek to support all the possible needs of HNWIs. These clients are usually highly sophisticated and expect an exceptionally high standard of service, and they also enjoy the possibility of choosing experiences that are not limited to the financial sphere.

Innovations include personal finance management solutions, products that enhance the security of online transactions and their personal data, as well as improved bank communication with clients. Some banks are also launching initiatives to inform clients about specific topics and offering knowledge about trending issues. An example is Bank Havilland, which organises a series of talks to provide insight and promote discussion about subjects that have, or may have, an impact on the overall business environment.

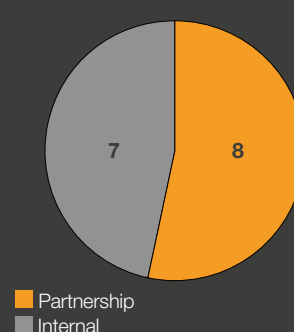
#### Number of innovations per area



#### Geographical area



#### Development



## SUSTAINABILITY

Sustainability is another strong theme in HNWI banking innovation. Most HNWIs realise that as a result of the sheer size of their assets they have a disproportionately large impact in terms of social and environmental issues. This is both due to their higher carbon footprint through increased travel and use of resources, but also through the investments they choose to

make. More and more private banks are taking serious steps to launch initiatives designed to offer their clients the opportunity to make positive social and environmental impacts. One example of this is Crédit Agricole's LCL Placements Impact Climat project, which offers HNWIs a range of climate focused investment solutions across the main traditional asset classes.


## USE OF TECHNOLOGY

There are also several other areas that private banks are focussing on in order to offer their clients the latest technological innovations. As discussed in the section on technology, some private banks are making use of 5G internet connections to offer clients the possibility of having meetings with personal bankers and advisors via augmented or virtual reality, and even holograms, from distant parts of the world. In this way the HNWI clients are able to get real-time professional advice regarding their wealth. The other area in which private banks are making strides is in the provision of crypto and blockchain services. These are considered a necessary step to meeting the increasing demand from customers.

In future, these private banks should be able to offer digital asset products and services, such as storage and transaction assistance. Some private banks have set up electronic safe deposit boxes for the exchange of documents between client, banker and third parties such as lawyers. In order to achieve these lofty ambitions, research shows that private banks are entering into strategic alliances with Fintech companies, as more than half of all private bank innovations were developed in partnership. There is, however, a significant obstacle in the form of a lack of clear regulation, but steps have been taken to improve transparency and provide stability in the industry.

**Total innovations observed 15**

### Innovations observed

 Bank	 Application	 Client	 Description
<b>Morgan Stanley</b>	Sustainable investing insights	HNWI	Impact Quotient is a sustainable investing and reporting tool that gives wealth management clients new personalised insights into the social and environmental impact of their investment portfolios. Designed to assist clients in further integrating social and environmental dimension into their investment objectives, the application focuses on sustainability and impact goals. It provides clients with a comprehensive framework to identify and prioritise over 100 social and environmental impact preferences.
<b>HSBC</b>	Jade	HNWI	HSBC United Arab Emirates has launched Jade, a wealth management service that offers a combination of personalised relationship management, advanced wealth solutions and luxury lifestyle services to support the needs of HNWIs.
<b>Shanghai Pudong Development Bank</b>	"5G +" smart bank	HNWI	Customers at "5G+" smart bank can connect customers with their relationship manager remotely by using AR/VR and holography technology, providing them better experience.
<b>Julius Baer</b>	Digital Assets	HNWI	Julius Baer introduces a crypto assets offering, resulting from a partnership with Switzerland-based and FINMA-licensed SEBA Bank AG. As of now, Julius Baer provides its clients with access to various solutions for digital assets storage and transactions to meet an increasing demand.

# Special focus on Asset Servicing innovation

## Disruption in the asset servicing industry

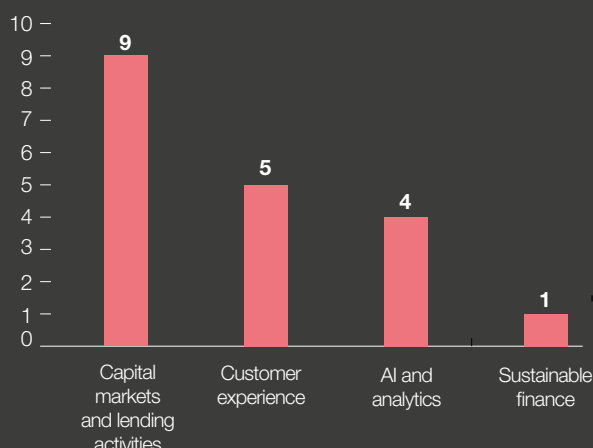
How new regulation, process automation and fee pressure are changing the industry

The asset servicing industry plays a key role in global financial markets. The industry ensures the safekeeping of financial assets and provides the infrastructure and the network through which financial markets participants connect. Moreover, asset servicing companies provide an array of back and middle-office operations necessary for the smooth functioning of capital markets and the fund industry. They offer securities services in line with the latest regulation and market needs, from custody and depository services, collateral management, fund administration and fund distribution.

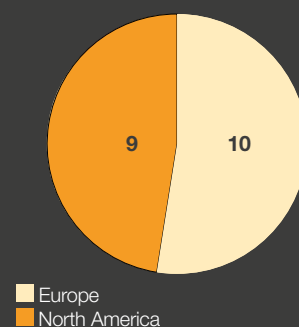
In recent years, the sector has been under increasing pressure by a number of external forces. Clients' expectations have been rising and they now require custodian banks to provide real-time data, regulatory support and personalised insights. Investors are pushing asset managers to reduce fees, whose pressure is consequently transferred to custodians. This translates into lower margins, which are forcing the entire sector to identify cost-cutting opportunities and innovative solutions to improve efficiency. New regulation over the last few years has been another driver of change in the industry, making operations more complex and increasing cost levels. All these elements motivate the need for continued research into innovations able to disrupt the industry and generate considerable growth opportunities. The strategy adopted by most asset servicers involves the identification of cost-cutting opportunities, the readiness to scale the business and the improvement of the client experience. Long-term strategists and consultants are also partnering with fintech companies to share talents and expertise in order to explore alternative ways of creating value.

One element that is clear to all the players in the sector is the urgent need of heavy investment in technology. Nonetheless, when implementing new technologies and innovations in their legacy systems, service providers need be careful and adopt a prudent approach, given their systemic role in financial markets. In this section, we highlight how asset servicing companies are responding to the above-mentioned challenges and focus on the most important innovative trends.

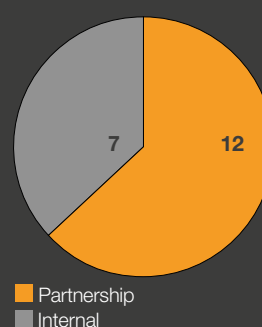
Number of innovations per area



Geographical area



Development





**Total innovations observed 19**

## PLATFORM EXTENSION

Client experience isn't only of critical importance in the B2C banking industry, but also in the asset servicing / B2B sector. Several innovations aim at improving this dimension, with players that are redesigning their platform and offering updated interfaces to satisfy evolving and increasingly complex clients' needs. These solutions offer users an improved oversight and control over their data. They also provide more clarity through a centralised approach and better management of reporting activities through aggregation of risk and performance data. To achieve this, service providers have started to update their

online platforms, with most of them providing easier access to their investment vehicles. The primary, and most successful, way asset servicers are approaching this dimension is through directly engaging with clients. Through the use of surveys and side-by-side user interactions, service providers are gaining useful insights on how to best implement new services and features to existing platforms. As a result, they have been able to improve workflow and offer a more fluid customer experience.

## INTEGRATION OF DATA AND ASSET MANAGEMENT SERVICING

There are also several other areas that private banks are focussing on in order to offer their clients the latest technological innovations. As discussed in the section on technology, some private banks are making use of 5G internet connections to offer clients the possibility of having meetings with personal bankers and advisors via augmented or virtual reality, and even holograms, from distant parts of the world. In this way the HNW clients are able to get real-time professional advice regarding their wealth. The other area in which private banks are making strides is in the provision of crypto and blockchain services. These are considered a necessary

step to meeting the increasing demand from customers. In future, these private banks should be able to offer digital asset products and services, such as storage and transaction assistance. In order to achieve these lofty ambitions, research shows that private banks are entering into strategic alliances with Fintech companies, as more than half of all private bank innovations were developed in partnership. There is, however, a significant obstacle in the form of a lack of clear regulation, but steps have been taken to improve transparency and provide stability in the industry.

## FUND DISTRIBUTION SERVICES

Another clear trend noticed in the asset servicing industry is the attempt to provide integrated and comprehensive support concerning the distribution of products on a global level. Providers are partnering with the world's leading fund distribution platforms and are expanding their services to developing markets beyond Europe and the United States so as to assist international clients with cross-border distribution.

Investment managers prefer to rely on a single provider that ensures not only a broad array of products to several client types, but also distribution channels across a variety of domiciles. Asset servicers are also taking advantage of the needs of new user segments, with considerable growth opportunities when dealing with complex investment vehicle structures, independent of geography and asset classes.

## MIDDLE-OFFICE SERVICES




Comprehensive solutions that streamline asset servicing activities, from investment management to the distribution interactions are becoming a necessity for the asset servicing industry. These innovations aim at improving the internal efficiency of the custodian or transfer agent from a holistic perspective. The focus is on real-time analytics, tailor-made reporting tools and collateral management services that help asset managers comply with specific regulations. The technology supporting these advancements is Robotic Process Automation (RPA). Beyond the increase in speed and accuracy

introduced by robotic solutions, when combined with artificial intelligence they provide advantages and insights for the aggregation of information. An example of how it is possible to gain a competitive edge from artificial intelligence and machine learning applications is the service offered by Société Générale Securities Services. Together with the fintech company Addventa, they launched a solution for the automated drafting of portfolio management commentaries that allows clients to have instantaneous performance comments regarding their investments.

# Special focus on Asset Servicing innovation

Total innovations observed **19**

## Innovations observed

		
Bank	Application	Description
<b>Northern Trust</b>	Middle-office services	Northern Trust expanded its collateral management services for over-the-counter (OTC) derivatives trading. The new functionality will enable asset managers and institutional investors to outsource key aspects of regulatory compliance to Northern Trust and optimise collateral selection, and in so doing driving efficiencies in how they meet margin obligations.
<b>CACEIS Bank</b>	Platform extension	CACEIS's servicing portal, OLIS, has been redesigned in order to provide clients with greater clarity, fluidity and better control over their data. The redesigned OLIS portal provides a tablet version and a dashboard page that covers all CACEIS business lines. Clients have easy access to their data and a clear overview of portfolios and transactions, including fund raising, order tracking and NAV validation. Operational data is displayed in real-time, leveraging the group's Big Data architecture.
<b>Société Générale</b>	Fund distribution services	Société Générale launched "D-View", a fund distribution analytics solution for asset managers. With this tailor-made reporting and analytics solution, Société Générale offers asset managers an innovative tool for decision support in the field of distribution strategy for their funds across domiciles.
<b>The Bank of New York Mellon</b>	Integration of data and asset management servicing	The Bank of New York Mellon Corporation and Bloomberg announced a strategic alliance that further integrates BNY Mellon's data, analytics, and servicing capabilities with AIM, Bloomberg's portfolio management, trading and compliance solution. With automated connectivity and standardised data delivery between Bloomberg AIM and BNY Mellon, common clients will experience faster onboarding, higher straight-through processing rates and more efficient data exchanges.
<b>BNP Paribas</b>	Middle-office services	BNP Paribas and BlackRock announced an alliance to deliver integrated end-to-end investment management capabilities to mutual clients.
<b>J.P. Morgan</b>	Integration of data and asset management servicing	J.P. Morgan and Bloomberg announced a collaboration on a solution that transforms the post-trade workflow through direct front-to-back process, product, and data integration.



# Special focus on Partnerships

## Creating Alliances for the Future

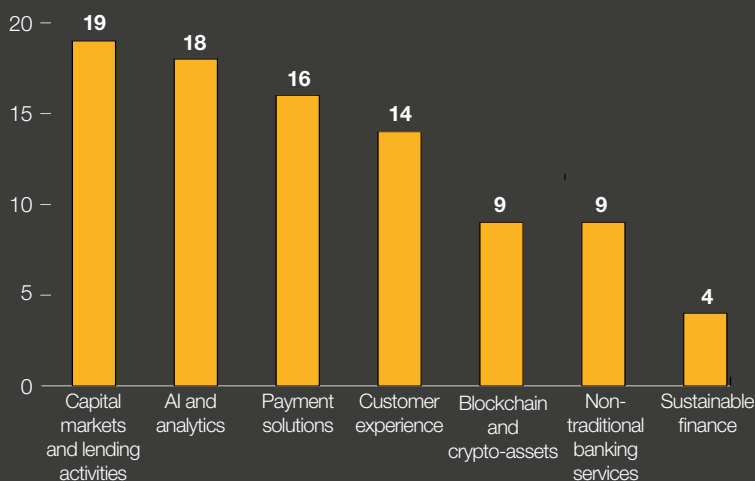
How partnerships are helping banks get on board the innovation bandwagon

Effective innovation isn't always the easiest process, and banks are finding that they have two distinct routes. Either they can execute the innovation process internally, or they can make use of strategic partners. These new entrants and fintech companies have already made the huge tech-investments needed for success. A number of banks around the world are realising that they simply do not have the required internal resources in order to keep pace with the latest tech developments. But by creating synergies with other tech companies, startups and fintech boutiques, the path to innovation is proving to be significantly easier.

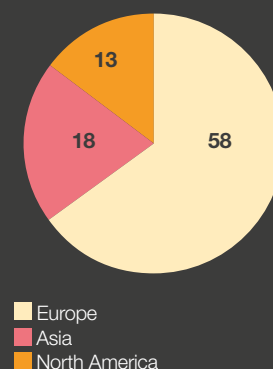
The small size of many of these companies enables them to swiftly adapt to the latest technologies and they don't need to wade through the old-fashioned legacy core systems that many banks are hampered by. This process of partnering for innovation happens through the sharing of knowledge, talent and creation of ad-hoc spaces like in-house incubators. Alliances of this type allow banks to offer new digital banking solutions and to meet customer's technological expectations.

There were a total of 89 unique innovations identified in the study group that involved partnerships, extending to every category of the study, but primarily in the field of technological innovations. By presenting a selection of innovations that involved alliances between banks and a partner company, we trust that the incredible possibilities that strategic alliances hold become apparent.

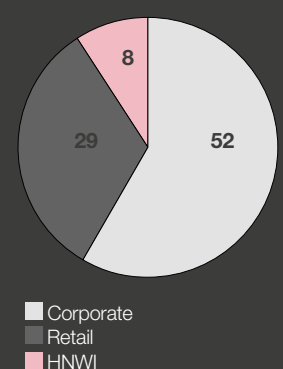
Number of innovations per area







Geographical area



Customer type








**Total innovations observed 89**
**Innovations observed**

 Bank	 Partner	 Partner type	 Category	 Description
<b>Banque de Luxembourg</b>	LuxTrust	Fintech	Customer Experience	Banque de Luxembourg, which has partnered with LuxTrust to offer clients innovative authentication solutions, was the first Luxembourg bank to deploy LuxTrust solutions in Belgium. It will also be the first Luxembourg bank to accept itsme® digital identity for clients living in Belgium.
<b>BCEE</b>	CrossLend	Fintech	Capital markets and lending activities	Taking advantage of CrossLend's innovative loan securitisation product, BCEE bank will continue to expand its presence in the securitisation market. It will enable institutional investors to invest in cleared securities backed by pan-European loan products or other eligible assets, in multiple currencies.
<b>BNP Paribas</b>	IBM	Big tech	Non-traditional banking services	BNP Paribas is working in partnership with IBM to build a dematerialised server, which would begin operating in July 2020. Initially designed for its own use, this infrastructure could be opened up to other banks as a commercial service.
<b>BNP Paribas</b>	Allfunds	Fintech	Capital markets and lending activities	BNP Paribas and Allfunds, a world class independent leader in wealth technology, agreed to form one of the world's leading fund and wealthtech platforms. With this agreement, both companies aim at developing the future generation of fund distribution services relying on each other's expertise.
<b>BNY Mellon</b>	BlackRock	Asset Manager	Customer Experience	BNY Mellon and BlackRock announced a strategic alliance to deliver integrated data, technology, and asset management servicing capabilities to common clients. These new capabilities integrate BNY Mellon's data insights, accounting, and servicing tools into Aladdin®, BlackRock's investment and operating platform for investment managers.
<b>China Construction Bank Corporation</b>	Tencent Group	Big tech	AI and analytics	Together with Tencent Group, the bank set up a Fintech innovation lab to conduct R&D in areas such as Artificial intelligence, big data, cloud computing, and blockchain.
<b>Clearstream</b>	Escent	Consulting	AI and analytics	Over the next four years, a joint research project will explore how Artificial Intelligence (AI) and Natural Language Processing (NLP) can be used to simplify and standardise requirements analysis for IT projects in the financial industry. The project aims eventually to render processes more cost- and time-efficient.
<b>Crédit Mutuel</b>	IBM	Big tech	AI and analytics	Cognitive Factory is a powerful innovation incubator, bringing together engineers specialising in AI, business experts from the Crédit Mutuel group and IBM experts. Crédit Mutuel announced the strengthening of its strategic partnership with IBM with the aim of gradually deploying artificial intelligence solutions across all operations.

# Special focus on Partnerships

Total innovations observed **89**

## Innovations observed

 Bank	 Partner	 Partner type	 Category	 Description
<b>Credit Suisse</b>	Privé Technologies	Fintech	Capital markets and lending activities	Investment bank Credit Suisse has teamed up with Privé Technologies to improve its offering to external asset managers (EAMs) in Asia Pacific. Privé is a software company based in Hong Kong that specialises in digital wealth management solutions. The collaboration will see its digital tools and services being made available through Credit Suisse.
<b>Credit Suisse</b>	Allfunds	Fintech	Capital markets and lending activities	Credit Suisse announced the combination of its third party investment fund platform Credit Suisse InvestLab with Allfunds. The agreement will create a global fund distribution platform with combined assets under administration (AuA) of more than CHF 570bn and distinct distribution competences.
<b>Deutsche Bank</b>	Qplex	Fintech	Customer experience	The Qplex software will serve as the basis for Deutsche Private Port, providing the ability to map, analyse and manage all asset classes including illiquid investments such as real estate and private equity.
<b>Goldman Sachs</b>	Apple	Big tech	Payment solutions	Goldman Sachs has partnered with Apple to launch a game-changing credit card. Designed to help consumers lead a healthier financial life, Apple Card aims to revolutionise the credit card experience. Key features include no fees, daily cash back and seamless integration into Apple's mobile devices. Apple Card introduces a new level of privacy, security and transparency to credit cards, allowing consumers to quickly and easily analyse their spending patterns and calculate how much they could save in interest charges by paying off different portions of their balances.
<b>ING Group</b>	Katana	Fintech	Capital markets and lending activities	Katana is an advanced analytics platform that supports portfolio managers in making faster and sharper investment decisions in the bond markets by using computational power and machine learning algorithms.
<b>ING Group</b>	Ascent	Fintech	AI and analytics	ING has invested in US-based regulatory technology company Ascent. Using machine learning and natural language processing, Ascent helps companies to build, manage and automate regulatory compliance. The investment, made via ING Ventures, part of a \$19.3 million Series B funding round, was done in conjunction with various other companies and investors.



**Total innovations observed 89**
**Innovations observed**

				
Bank	Partner	Partner type	Category	Description
ING Group	Google and PwC	Big tech and consulting	AI and analytics	The early warning system (EWS) helps credit risk analysts make quicker and more informed decisions and results from the partnership of ING with Google and PwC. The EWS is an AI-powered application that collects and analyses large amounts of data to identify whether clients are exposed to potential risks, a task traditionally performed manually by risk analysts. EWS elaborates real-time market data and publicly available information, processing up to 80,000 articles every day thanks to the use of Google's natural language processing and translation services.
Lloyds Banking Group	Microsoft	Big tech	AI and analytics	Lloyds Banking Group has announced a strategic partnership with Microsoft focused on accelerating the Group's digital transformation. The new partnership includes the development of Microsoft Managed Desktop (MMD) offering productivity tools within Office 365, the robust security capability of Windows10 and an advanced device solution to support evergreen currency management.
MUFG	Chainalysis	Fintech	Non-traditional banking services	Chainalysis is a provider of investigation and compliance solutions to combat against illicit cryptocurrency activities. MUFG has invested in Chainalysis and its compliance technology will provide the insights and anti-money laundering controls banks need in order to establish next-generation compliance frameworks.
Northern Trust	AcadiaSoft	Fintech	Capital markets and lending activities	Northern Trust expanded its collateral management services for over-the-counter (OTC) derivatives trading. The new functionality will enable asset managers and institutional investors to outsource key aspects of regulatory compliance to Northern Trust and optimise collateral selection – driving efficiencies in how they meet margin obligations.
Northern Trust	Lumint Corporation	Fintech	AI and analytics	Northern Trust deploys artificial intelligence for currency management using advanced machine learning. The solution will provide a greater oversight of thousands of daily data points and help reduce risk throughout the currency management lifecycle.
Société Générale	Addventa	Fintech	AI and analytics	Société Générale and Addventa announced a partnership to launch a service for automated drafting of portfolio management commentaries based on artificial intelligence solutions. The customers will benefit from this instantaneous service that writes performance comments about their funds.
Société Générale	Lumo	Fintech	Sustainable finance	Lumo is a fintech company that combines leading expertise in crowdfunding and renewable energies to accelerate the energy transition. It gives individuals and companies the opportunity to help finance a selection of renewable energy projects in France. Since its creation, the platform has been used to collect funds from thousands of individual investors in favor of the financing of approximately 40 wind, solar and hydroelectric projects. By acquiring this crowdfunding solution, Société Générale, a renewable energy finance leader, can better support its major energy clients in developing their projects.

# Special focus on Partnerships

Total innovations observed **89**

## Innovations observed

 Bank	 Partner	 Partner type	 Category	 Description
Standard Chartered	IBM	Big tech	AI and analytics	Trade AI Engine is a joint solution developed in partnership with IBM to enhance the client experience in trade document processing through increased operational efficiency and strengthened operational controls. The innovative solution allows the Bank to handle high volumes of diverse back office tasks with greater efficiency and accuracy, thus offering a more seamless trade processing experience for clients.
Standard Chartered	Infor	Big tech	Customer experience	Through a partnership with Infor and the integration of its Nexus network, Standard Chartered will allow its clients to digitise their financial supply chain, decreasing supply chain delays and frictions, allowing suppliers to benefit from improved access to capital. The Infor Nexus network transforms the traditionally manual process of data matching across multiple commercial documents including purchase orders, invoices and transport documents.
State Street	CLS	Fintech	Capital markets and lending activities	State Street announced a collaboration with CLS, an FX market infrastructure group delivering settlement, processing and data solutions, to provide asset managers with a consolidated view of CLSSettlement information across their accounts for the first time. The collaboration allows asset managers to efficiently manage their trades eligible for CLSSettlement, along with all trades across their accounts with different custodians.
RBC	WayPay	Fintech	Customer experience	RBC acquired the fintech startup WayPay to add an automated account payable solution to its industry-leading suite of digitally-enabled business offerings. WayPay is a cloud-based payments fintech from Burlington, Ontario that offers business clients a best-in-class solution for accounts payable automation and payment optimisation. By seamlessly connecting to leading accounting platforms, WayPay specialises in helping companies reduce their payables pain points by improving the reconciliation and approvals process, creating significant time and cost savings.
Royal Bank of Scotland	G4S	Big tech	Customer experience	Intelligent Safe is an innovative and secure cash management solution for businesses, launched by Royal Bank of Scotland in partnership with G4S. Businesses using Intelligent Safe deposit cash into the safe throughout the day, where it is counted and validated before their account is credited daily with that day's deposits. The cash is then securely held in the device until it triggers a collection.
UniCredit	FinDynamic	Fintech	Customer experience	UniCredit has announced a collaboration with FinDynamic, an Italian fintech company offering dynamic discounting programs, as it seeks to enhance its working capital offering for corporate clients. Dynamic discounting is a solution that allows clients to offer their suppliers early payment of their invoices in exchange for a discount. This facilitates the use of the buyer's strong cash position while providing liquidity to their suppliers. FinDynamic's solution allows both the buyer and its suppliers to automatically view invoices and easily select approved invoices for early payment.

# List of banks observed

Bank Name	Innovations	Geographical area	Bank Name	Innovations	Geographical area
ABN Amro	3	Europe	ICICI Bank	1	Asia
Agricultural Bank of China	6	Asia	Idea Bank	1	Europe
Banco Santander	7	Europe	Illimity Bank	1	Europe
Bank of America	5	North America	Industrial Bank	7	Asia
Bank of China	8	Asia	ING Group	8	Europe
Bank of Communications	3	Asia	Intesa Sanpaolo	2	Europe
Banque de Luxembourg	2	Europe	JPMorgan	5	North America
Banque Havilland	1	Europe	Julius Baer	2	Europe
Banque Raiffeisen, Société Coopérative	1	Europe	Krungsri	1	Asia
Barclays	6	Europe	Lloyds Banking Group	2	Europe
BB&T	1	North America	Macquaire Group	1	Australia
BBVA	5	Europe	Mitsubishi UFJ Financial Group	2	Asia
BCEE	2	Europe	Mizuho Financial Group	4	Asia
BIL	4	Europe	Morgan Stanley	5	North America
BMO Financial Group	4	North America	MUFJ Bank	1	Asia
BNP Paribas	11	Europe	Natixis	1	Europe
CACEIS Bank	2	Europe	NORD/LB CBB	1	Europe
Caixabank	2	Europe	Northern Trust	6	North America
Capital One	1	North America	PNC Bank	1	North America
China Citic Bank	2	Asia	Postal Savings Bank of China	3	Asia
China Construction Bank	4	Asia	Rabobank	2	Europe
China Everbright Bank	3	Asia	Raiffeisen Bank	5	Europe
China Merchants Bank	7	Asia	Royal Bank of Canada	6	North America
China Minsheng Bank	1	Asia	Royal Bank of Scotland	2	Europe
Citibank	2	North America	Sberbank	1	Europe
Clearstream	1	Europe	Scotiabank	2	North America
Commonwealth Bank	3	Australia	Shanghai Pudong Development Bank	3	Asia
Crédit Agricole	6	Europe	Société Générale	12	Europe
Crédit Mutuel	3	Europe	Standard Chartered	4	Europe
Credit Suisse	3	Europe	State Street Bank	1	North America
DBS	1	Asia	Texas Capital Bank	1	North America
Deutsche Bank	8	Europe	The Bank of New York Mellon	2	North America
DZ Bank	2	Europe	Toronto Dominion Bank	2	North America
Erste Group	1	Europe	UBS	6	Europe
Goldman Sachs	2	North America	Unicredit	4	Europe
Group BPCE	3	Europe	US Bancorp	2	North America
HSBC	5	Europe	Wells Fargo	5	North America

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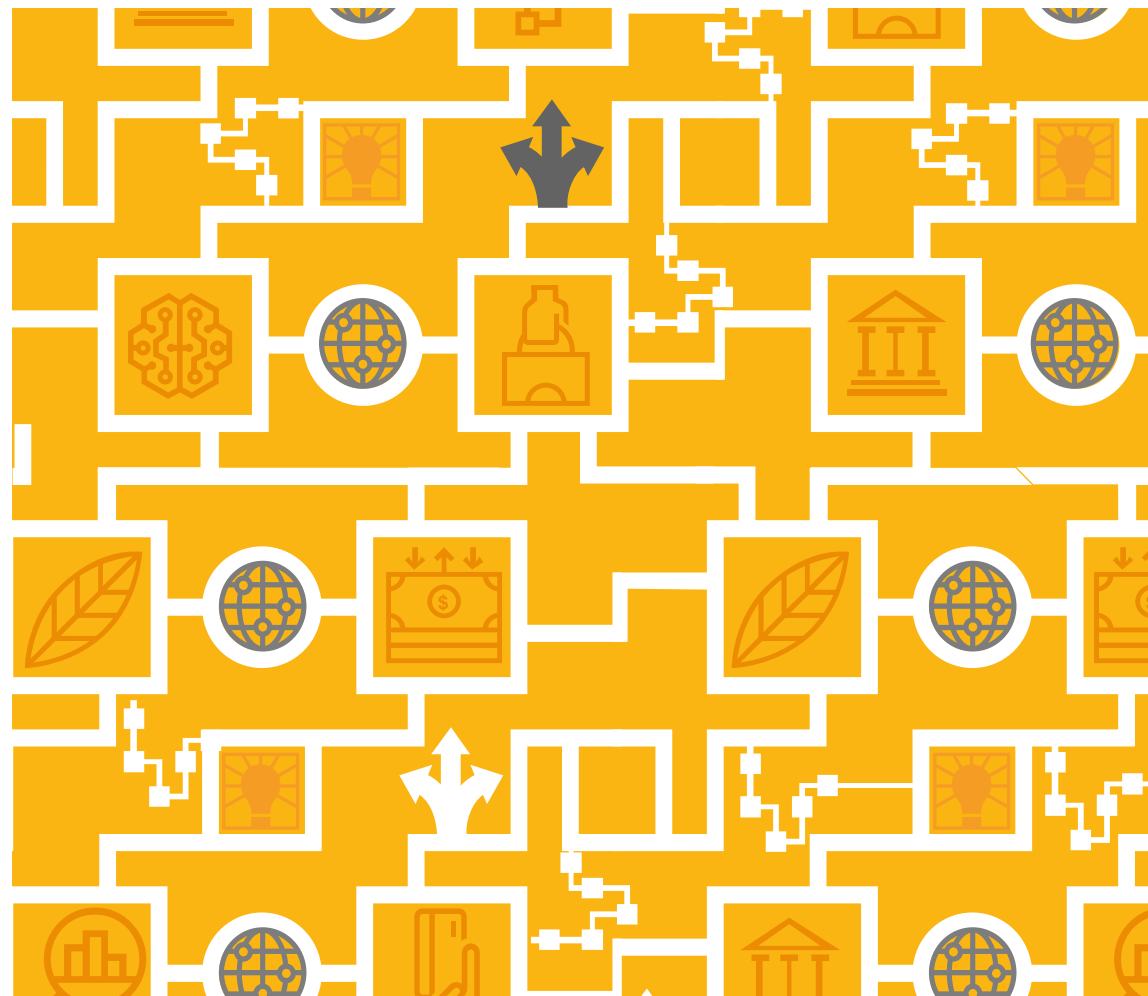






# 2

## Overview of the Luxembourg banking sector's evolution



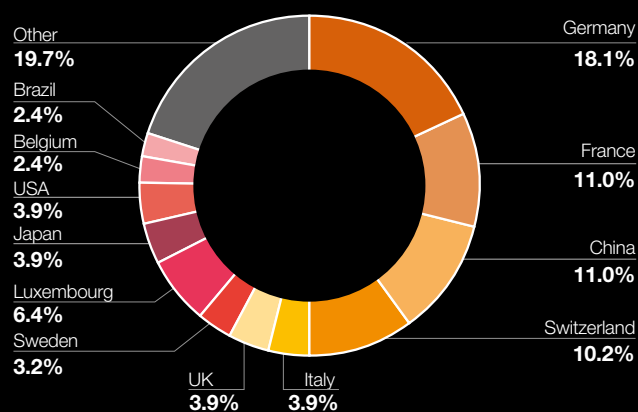
# Key takeaways – Overview of the Luxembourg banking sector's evolution<sup>1</sup>

- With 127 authorised banks at year-end 2019, the number of banks has slightly decreased by eight.
- 125 of the 127 authorised banks have a universal banking licence, whereas two banks (all of them belonging to the German segment) have a mortgage-bond banking licence.
- Regarding the legal status, 85 banks are under Luxembourg law, 32 are branches of banks from EU Member States or a country considered on equal terms and 10 are branches of banks from non-EU Member States.
- In terms of geographical representation in the Luxembourg financial centre, German banks still make up the largest group at 18.1%, followed by French banks and Chinese banks, both with 11.0%.
- The following banks were deregistered during 2019:
  - Banque Carnegie Luxembourg S.A. (merged with Union Bancaire Privée (Luxembourg) S.A.)
  - Hauck & Aufhäuser Fund Platforms S.A. (activities transferred to Hauck & Aufhäuser Privatbankiers AG, Niederlassung Luxembourg)
  - Northern Trust Global Services SE, Luxembourg branch (activities transferred to Northern Trust Global Services SE)
  - NatWest Markets plc, Luxembourg Branch (activities transferred to RBS International Depository Services S.A.)
  - The Bank of New York Mellon (International) Ltd, Luxembourg Branch (activities transferred to the Bank of New York Mellon SA/NV, Luxembourg Branch)
  - Banco BTG Pactual, Luxembourg Branch (discontinuing business activities)
  - ABLV Bank Luxembourg S.A. (compulsory liquidation)
  - State Street Bank Luxembourg S.C.A. (cross-border merger with State Street Bank International GmbH)
  - Credem international (Lux) S.A. (discontinuing business activities)
  - Nordea Bank S.A. (voluntary liquidation)
  - DEPFA Pfandbrief Bank International S.A. (voluntary liquidation)
  - Swedbank AB (publ), Luxembourg Branch (discontinuing business activities)
  - Credit Agricole Corporate and Investment Bank, Luxembourg Branch (discontinuing business activities)
- The following banks have started operations in 2019:
  - RBS International Depository Services S.A.
  - Northern Trust Global Services SE
  - HSBC France, Luxembourg Branch
  - Banking Circle S.A.
  - Barclays Bank Ireland plc, Luxembourg Branch

## Number of banks

Number of banks	2019	2018
Subsidiaries	85	89
Branches	42	46
<b>Total</b>	<b>127</b>	<b>135</b>

## Countries of origin of banks established in Luxembourg



\* Classification as per CSSF

## Headcount

2019

26,337

2018

26,317

- In 2019, the number of people employed in the banking sector was flat (+ 20 staff) compared to prior year.
- While employment remained stable for 12.1% of banks, the increase in staff at 48.6% of banks offset the staff reductions observed at 39.3% of banks in Luxembourg.
- The number of employees with higher education (BAC+5 or higher) increased by 4.0% while those with equivalent of BAC+5 or lower decreased by 7.9%.

1. Source: CSSF Annual Report 2019

## Balance sheet total (in EUR million)

2019

821,775

2018

774,911

- In 2019, the balance sheet total increased by EUR 46.9 billion (+6.0%). 60% of banks saw their balance sheet grow, especially some banking groups that moved some of their activities from the UK to Luxembourg due to Brexit.
- On the asset side, the increase was principally driven by loans and advances to customers (+9.1%) followed by loans and advances to credit institutions (+8.3%). The increase in loans and advances to credit institutions can be explained in particular by depositary and private banks placing their excess liquidity at very short term with other credit institutions, including entities within the same group.
- On the liability side, amounts owed to customers, consisting of deposits continued to increase strongly (+10.0%). This shows that the automated exchange of financial and fiscal information between EU member states did not negatively impact this important source of financing.

- Net profits remained stable, slightly increasing by EUR 13.0 million (+0.3%), with 80% of banks having positive results in 2019, up from 78% in prior year.
- General expenses have continued to increase with an increase by 8.4%, mainly due to the human and technical resources necessary for the transfer of activities to Luxembourg linked to Brexit.
- Net provisioning was down by 38.1%, as the assets in Luxembourg are of good quality as is shown by the non-performing loan ratio of 0.6%.

## Annual net profit or loss (in EUR million)

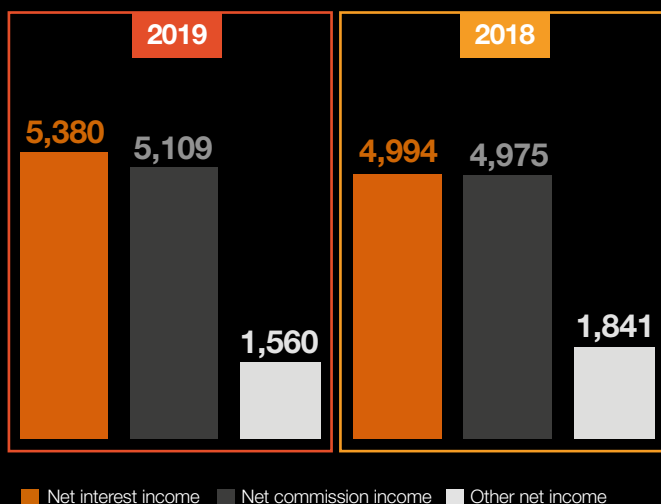
2019

3,667

2018

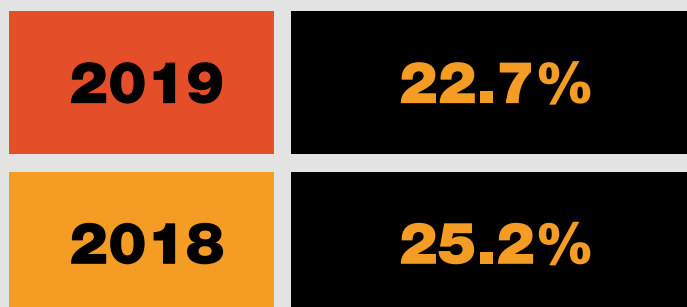
3,654

## Banking income (in EUR million)



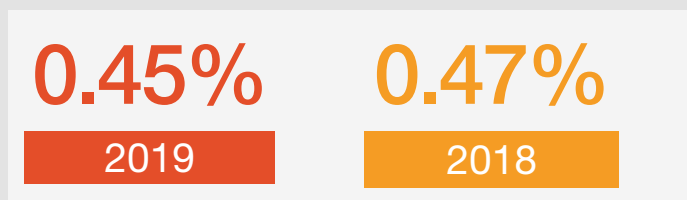
- In 2019, the net interest income increased by 7.7% due to both a growth in the volume of loans as well as a better return on assets for the majority of banks.
- Net commission income grew by 2.7%, linked to both the favourable evolution of financial markets in 2019 and to banks moving activities from the UK to Luxembourg as a result from Brexit.
- Other net income is down by 15.3% due to both lower realised gains on securities portfolios and lower dividends received.

## Solvency ratio

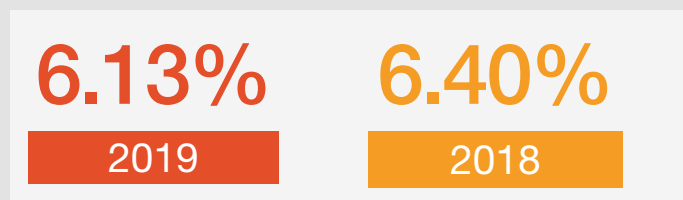


- The solvency ratio decreased to 22.7%, driven by the increase in risk weighted assets, driven by the increase in loans and advances to customers (+9.2%). Own funds also grew, especially driven by some banks that saw strong growth of their total assets, albeit less strongly.
- Nevertheless, the Luxembourg banks continue to have a high capitalisation rate, well above the 8.0% required by Basel IV (10.5% including capital buffer.)

## Return on assets

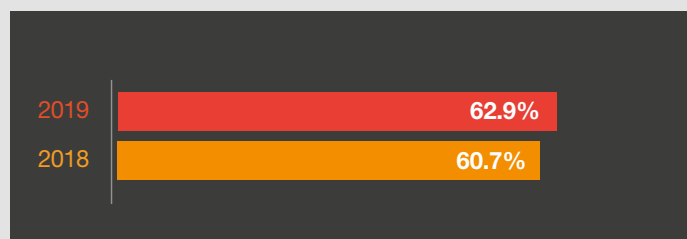


## Return on equity



- Both ratios decreased slightly, as annual net profits remained stable, whereas total assets grew by 6.0%, as a result of increasing lending. Own funds grew by 3.6%, driven by increased retained earnings, as well as capital increases at some banks.

## Cost-income ratio



- Despite the increase in banking income (+2.0%), the cost-income ratio increased due to the growth of general expenses (+8.4%).
- During the year, the majority of banks saw their ratios increase, mainly driven by costs linked to business growth, but also due to transformation projects.

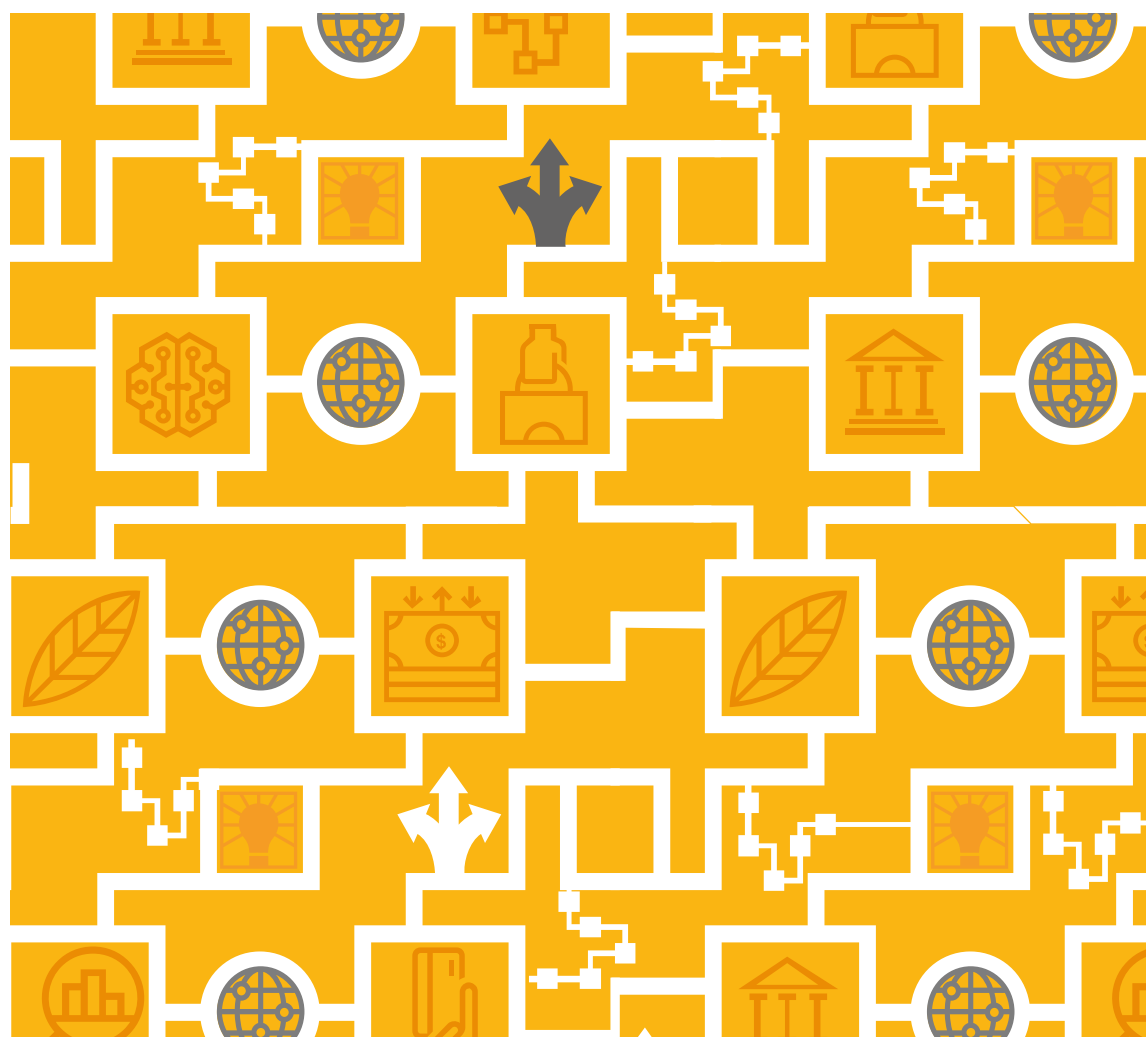
$$\text{CIR} = \frac{\text{staff costs} + \text{administrative costs (incl. depreciation)}}{\text{net interest and commission income} + \text{net result on financial operations} + \text{other operating result} + \text{risk provisioning}}$$





# 3

## Overview of developments in each segment





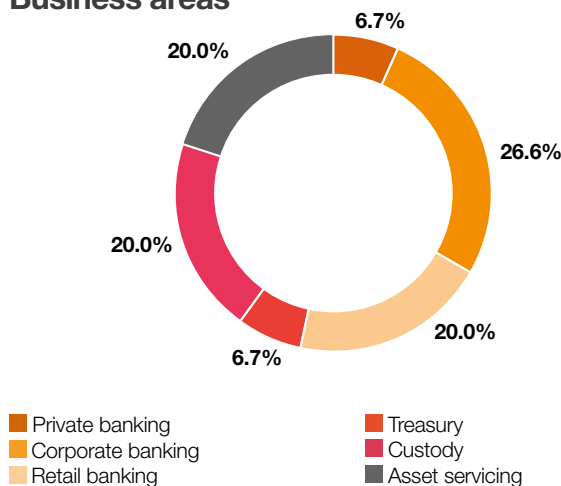
# Key takeaways – UK/North American segment

- There were two new banks in 2019: RBS International Depository Services S.A., which obtained the banking license in February 2019, and Northern Trust Global Services SE which moved its headquarters from the UK to the Luxembourg due to Brexit. On the other hand, State Street Bank Luxembourg S.C.A., merged cross-border into State Street Bank International GmbH, located in Munich. In 2019, Internaxx Bank S.A. was fully acquired by Swissquote Group and rebranded as Swissquote Bank Europe S.A. and is now part of the Swiss segment.
- As a direct response to Brexit, in the beginning of 2019, J.P. Morgan Bank Luxembourg S.A. ("J.P. Morgan") absorbed the UK entity J.P. Morgan International Bank Limited, thus becoming the Group's flagship EU banking entity. The move saw the bank's total assets grow by EUR 28.9 billion (+140.4%). Consequently, the total assets of the segment increased by EUR 27.2 billion (+43.7%).
- The segment is characterised mainly by asset servicing activities, thus net commission income is a key driver which showed a 35.1% increase compared to prior year. The net commission income for the segment mainly stems from J.P. Morgan that saw an increase of 129.1% following the transfer of activities to Luxembourg and the resulting client migration and Wealth Management business integration but also due to Securities Services' organic growth.
- Despite the increase in net banking income, expenses have substantially increased as well, with staff costs up to 80.0% and administrative expenses up to 56.9%, again both driven largely by J.P. Morgan. Overall, four out of seven banks saw increases in staff costs and five out of seven saw increases in administrative expenses. Credit risk provisioning was substantially lower, driven by PayPal (Europe) S.à r.l. et Cie, S.C.A.'s sale of its US consumer credit portfolio in prior year.
- Overall, all six out of seven banks were profitable this year, with J.P. Morgan contributing the most with the amount of EUR 298.6 million, followed by PayPal with EUR 125.8 million.
- The segment's headcount has significantly increased by 1,350 FTE (+55.4%), driven by J.P. Morgan (+1,164 FTE) due to the aforementioned merger, followed by Northern Trust Global Services SE (+165 FTE), mainly due to the transfer of staff from the Luxembourg management company to the bank.

## Number of banks

Number of banks	2019	2018
Subsidiaries	8	7
Branches	7	9
<b>Total</b>	<b>15</b>	<b>16</b>

## Business areas



## Annual net profit or loss (in EUR million)



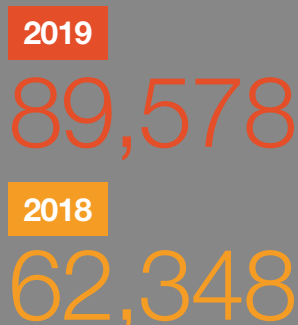
## Headcount



## Cost-income ratio



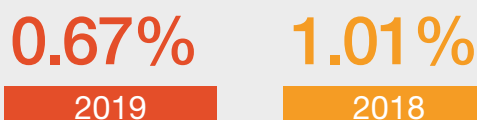
## Balance sheet total (in EUR million)



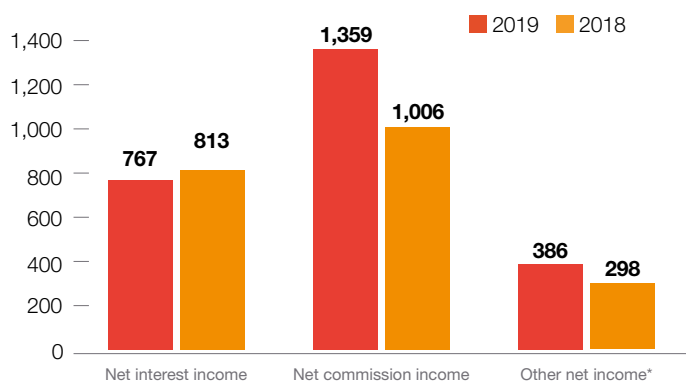
## Return on equity



## Return on assets

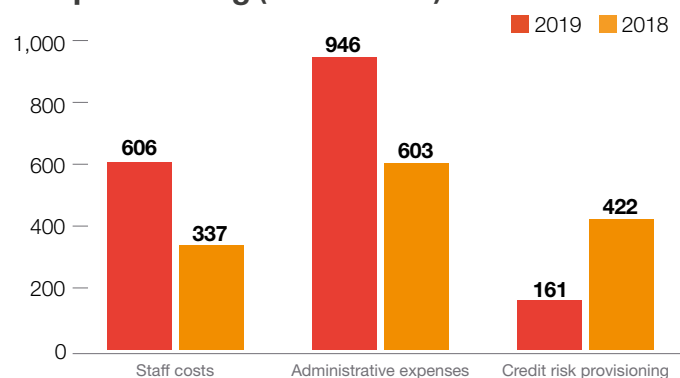


## Banking income (in EUR million)

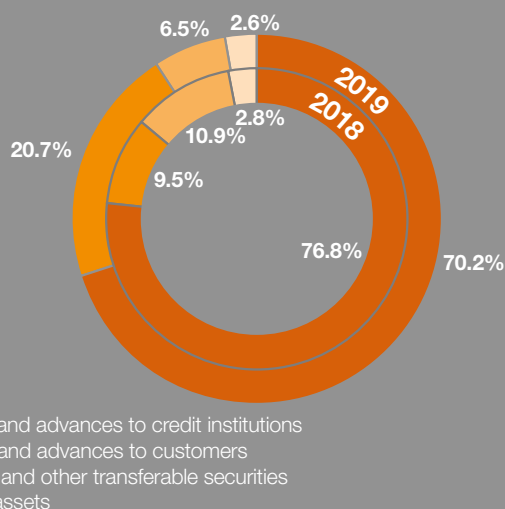


\*Other net income includes: net profit/loss on financial operations (including gains/losses on derivatives & revaluation gains/losses), other net operating income and dividend income

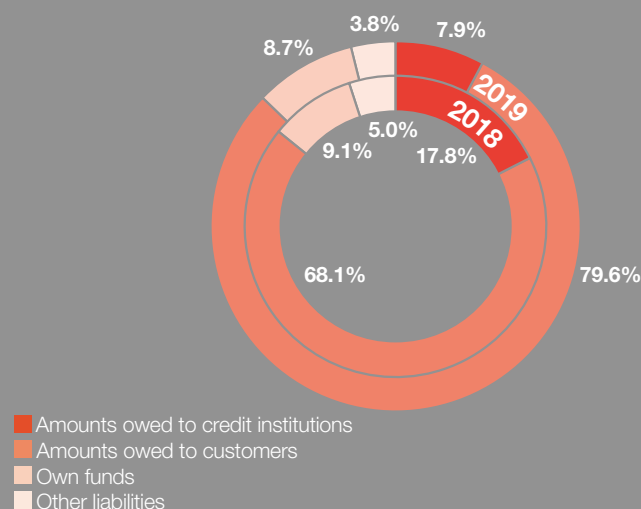
## Staff costs, administrative expenses and credit risk provisioning (in EUR million)



## Breakdown of assets



## Breakdown of liabilities



## Ranking of balance sheet totals (in EUR million)

Ranking	Bank	2019	2018	Shift	Change in rank
1	J.P. Morgan Bank Luxembourg S.A.	49,528	20,599	140.4%	=
2	RBC Investor Services Bank S.A.	17,697	17,855	-0.9%	=
3	PayPal (Europe) S.à r.l. et Cie, S.C.A.	7,447	6,958	7.0%	▲ +1
4	HSBC Private Bank (Luxembourg) S.A.	7,009	10,248	-31.6%	▼ -1
5	Northern Trust Global Services SE*	5,240	4,414	18.7%	NEW
6	John Deere Bank S.A.	2,558	2,180	17.4%	=
7	Brown Brothers Harriman (Luxembourg) S.C.A.	99	96	3.5%	=
	<b>Total</b>	<b>89,578</b>	<b>62,350</b>	<b>43.7%</b>	

## Ranking of annual net profit or loss (in EUR million)

Ranking	Bank	2019	2018	Shift	Change in rank
1	J.P. Morgan Bank Luxembourg S.A.	298.6	151.4	97.2%	▲ +1
2	PayPal (Europe) S.à r.l. et Cie, S.C.A.	125.8	281.6	-55.3%	▼ -1
3	Northern Trust Global Services SE*	60.3	53.0	13.8%	NEW
4	Brown Brothers Harriman (Luxembourg) S.C.A.	43.9	44.4	-1.1%	▲ +1
5	RBC Investor Services Bank S.A.	38.9	72.9	-46.6%	▼ -2
6	John Deere Bank S.A.	35.6	28.9	23.2%	=
7	HSBC Private Bank (Luxembourg) S.A.	-0.7	0.2	-450.0%	=
	<b>Total</b>	<b>602.4</b>	<b>632.4</b>	<b>-4.7%</b>	

\* 2018 figures refer to the UK business before migration to Luxembourg

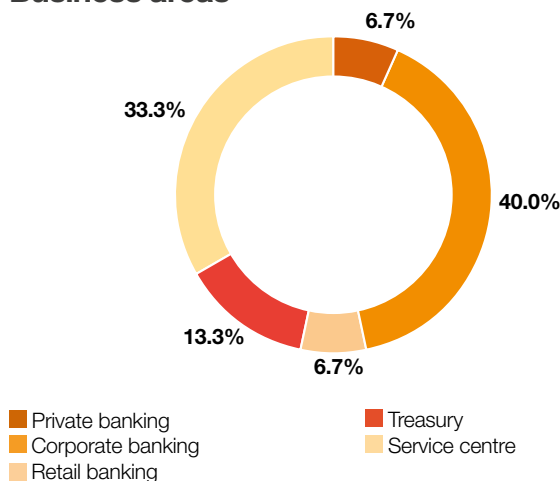
# Key takeaways – Chinese segment

- The Chinese banks operate predominantly in corporate banking (trade finance, project finance, bilateral and syndicated loans). Consequently, the net interest result represents 64.4% of the total net banking income of the Chinese segment. Bank of China (Luxembourg) S.A. ("BoC") incorporated a new branch in Greece in November 2019, thus increasing the number of branches from 18 to 19.
- The aggregate balance sheet of the Chinese segment decreased by EUR 689.1 million (-4.9%) due to a downturn in loans and advances to customers by EUR 943.8 million (-11.2%), which was partially offset by an increase in loans and advances to credit institutions (EUR +419.9 million; +12.5%). Industrial and Commercial Bank of China Europe S.A. ("ICBC") decreased its balance sheet by EUR 1,388.9 million (-20.3%), due to an overall decrease of the bank's loan business, whereas BoC increased its assets by EUR 916.2 million (+17.8%) through increased cash held and increasing interbank loans.
- On the liability side, there was a further shift from amounts owed to credit institutions to amounts owed to customers, albeit less strong than in prior year, that saw funding via customers becoming the main source of financing for Chinese banking groups. Their key driver was ICBC, reducing its amounts owed to credit institutions by EUR 1,298.7 million (-37.3%).
- Both net commission income and net interest income decreased slightly by 6.3% and 5.1% respectively, with the drop of net interest income being linked to ICBC's decrease in its loan portfolio. Other net income decreased by EUR 10.5 million, primarily driven by losses on foreign exchange trading incurred by China Construction Bank (Europe) S.A. ("CCB"). Furthermore, there was a notable increase in overall credit risk provisioning by EUR 17.7 million (+80.8%), driven by BoC's implementation of IFRS 9 that saw an increasing value adjustment in loans compared to prior year.
- On the human capital side, there was a notable increase in staff with a net growth of 61 FTE, chiefly at CCB (+39 FTE), with now 82 of its staff employed in Luxembourg and 99 in the EU branches, and BoC (+24 FTE). This resulted in overall higher staff costs that grew by 11.0%.

## Number of banks

Number of banks	2019	2018
Subsidiaries	6	6
Branches	7	7
<b>Total</b>	<b>13</b>	<b>13</b>

## Business areas



## Annual net profit or loss (in EUR million)



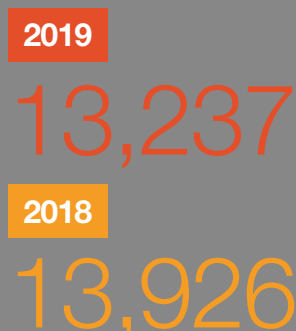
## Headcount



## Cost-income ratio



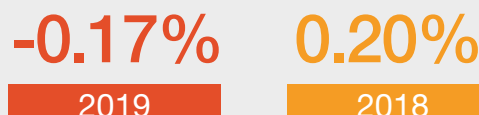
## Balance sheet total (in EUR million)



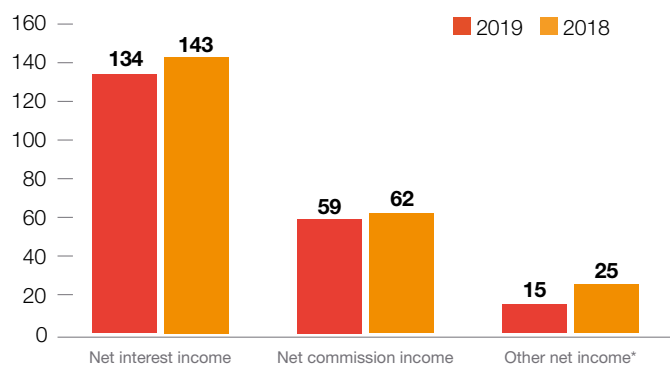
## Return on equity



## Return on assets

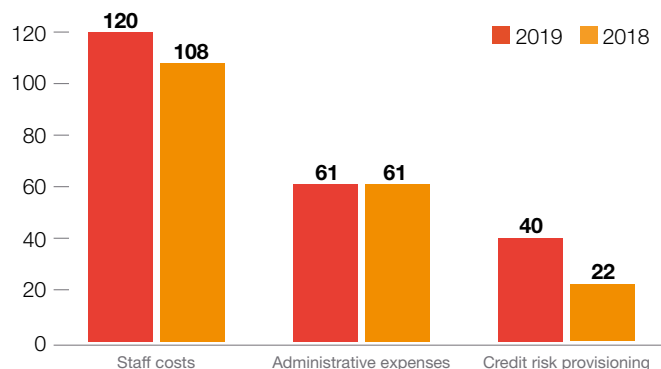


## Banking income (in EUR million)

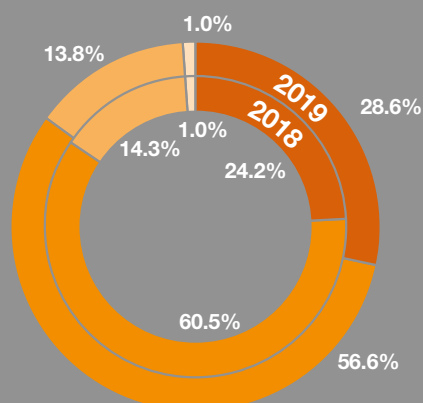


\*Other net income includes: net profit/loss on financial operations (including gains/losses on derivatives & revaluation gains/losses), other net operating income and dividend income

## Staff costs, administrative expenses and credit risk provisioning (in EUR million)

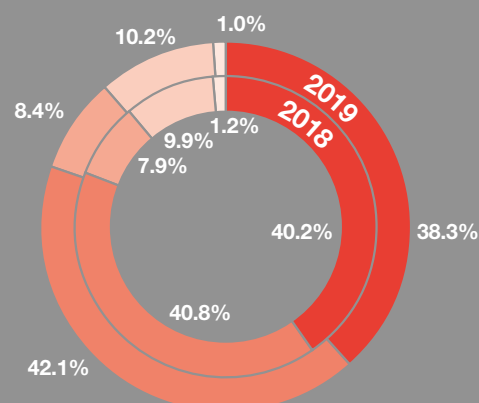


## Breakdown of assets



■ Loans and advances to credit institutions  
■ Loans and advances to customers  
■ Bonds and other transferable securities  
■ Other assets

## Breakdown of liabilities



■ Amounts owed to credit institutions  
■ Amounts owed to customers  
■ Debt securities and Subordinated debts  
■ Own funds  
■ Other liabilities

## Ranking of balance sheet totals (in EUR million)

Ranking	Bank	2019	2018	Shift	Change in rank
1	Bank of China (Luxembourg) S.A.	6,062	5,146	17.8%	▲ +1
2	Industrial and Commercial Bank of China (Europe) S.A.	5,436	6,825	-20.4%	▼ -1
3	China Construction Bank (Europe) S.A.	1,310	1,243	5.4%	=
4	Bank of Communications (Luxembourg) S.A.	372	640	-41.9%	=
5	China Everbright Bank (Europe) S.A.	35	33	6.1%	▲ +1
6	Agricultural Bank of China (Luxembourg) S.A.	22	40	-45.0%	▼ -1
	<b>Total</b>	<b>13,237</b>	<b>13,927</b>	<b>-5.0%</b>	

## Ranking of annual net profit or loss (in EUR million)

Ranking	Bank	2019	2018	Shift	Change in rank
1	Bank of China (Luxembourg) S.A.	19.8	34.8	-43.1%	=
2	Agricultural Bank of China (Luxembourg) S.A.	0.0	0.9	-100.0%	▲ +2
3	China Everbright Bank (Europe) S.A.	-0.8	-2.8	71.4%	▲ +2
4	China Construction Bank (Europe) S.A.	-3.1	2.4	-229.2%	▼ -2
5	Bank of Communications (Luxembourg) S.A.	-11.0	-9.7	-13.4%	▲ +1
6	Industrial and Commercial Bank of China (Europe) S.A.	-27.7	1.6	< -1,000.0%	▼ -3
	<b>Total</b>	<b>-22.8</b>	<b>27.2</b>	<b>-183.8%</b>	

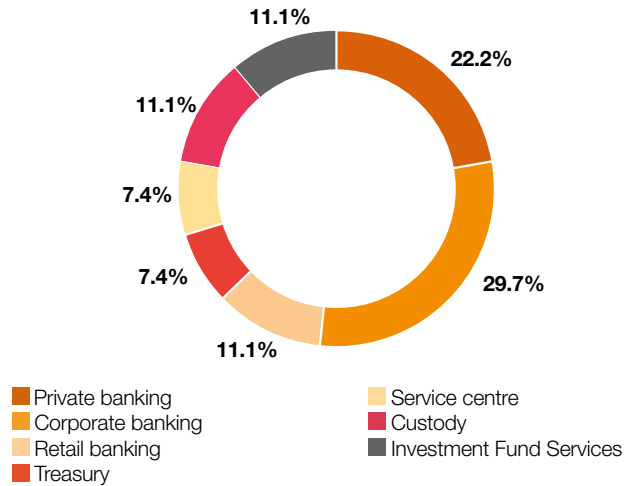
# Key takeaways – French segment

- In January 2020 Société Générale Bank and Trust S.A. changed its name to Société Générale Luxembourg S.A. (“SGL”). The number of subsidiaries analysed in the French segment remained stable at 9; the number of branches decreased from 4 to 3 due to the market exit of Crédit Agricole Corporate and Investment Bank, Luxembourg Branch.
- The aggregate balance sheet increased by EUR 4.6 billion (+5.7%), mainly driven by the growth in loans and advances to credit institutions (EUR +4.1 billion; +10.2%). However, this was solely due to Société Générale Luxembourg’s (“SGL”) increase in deposits with the Luxembourg Central Bank. On the liability side, there was an increase of the deposits received from credit institutions (EUR +3.6 billion; +12.1%) as well as of the deposits by customers (EUR +2.0 billion; +4.8%).
- Core banking income remained stable overall, with the balance shifting slightly towards net interest income that increased by 5.0%, whereas net commission income decreased by 7.9%. On the cost side, there were notable increases in staff costs (+6.9%) and administrative expenses (+5.0%). Other net income decreased substantially, as SGL received fewer dividends from its subsidiaries (EUR -132.2 million; -42.9%).
- The headcount increased by 63 (+2.1%), contributing to an increase in staff costs of EUR 22.3 million (+6.9%). The highest growth was at Banque de Luxembourg S.A. (“BDL”) (+55 FTE; +6.1%) and SGL (+21 FTE; +1.7%). Administrative expenses also slightly increased (EUR +14.7 million; +5.0%) again driven by SGL and BDL. At SGL the increase is due to the transformation of its operating model, preparing for the future with significant business and IT investments.

## Number of banks

Number of banks	2019	2018
Subsidiaries	9	9
Branches	3	4
<b>Total</b>	<b>12</b>	<b>13</b>

## Business areas



## Annual net profit or loss (in EUR million)

2019	2018
285	418

## Headcount

2019	2018
3,013	2,950

## Cost-income ratio



## Balance sheet total (in EUR million)

2019	2018
84,993	80,393

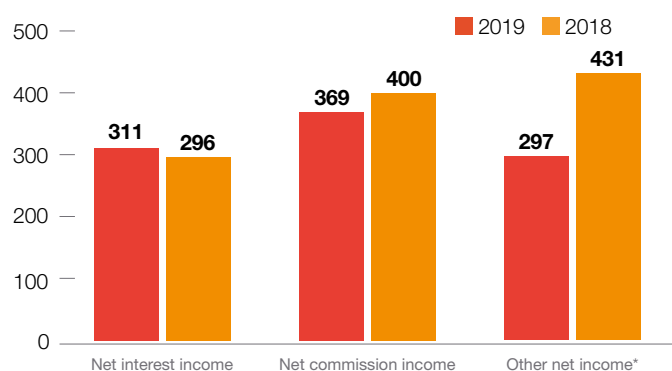
## Return on equity

2019	2018
5.90%	8.46%

## Return on assets

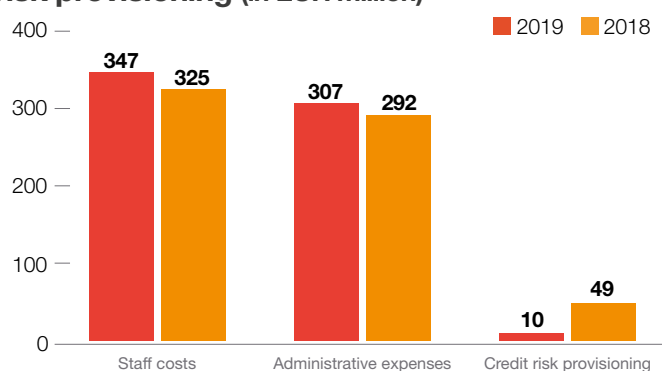
2019	2018
0.34%	0.52%

## Banking income (in EUR million)

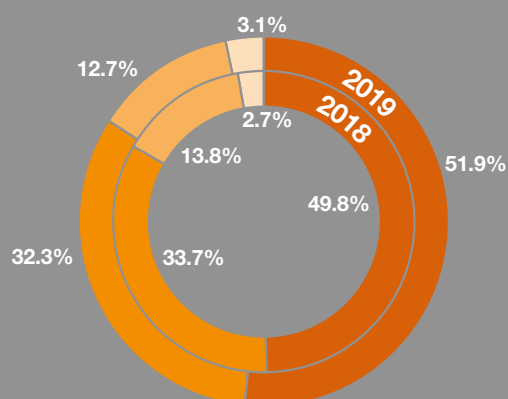


\*Other net income includes: net profit/loss on financial operations (including gains/losses on derivatives & revaluation gains/losses), other net operating income and dividend income

## Staff costs, administrative expenses and credit risk provisioning (in EUR million)

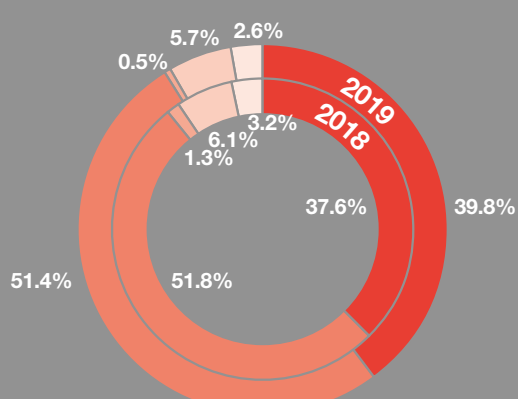


## Breakdown of assets



Loans and advances to credit institutions  
Loans and advances to customers  
Bonds and other transferable securities  
Other assets

## Breakdown of liabilities



Amounts owed to credit institutions  
Amounts owed to customers  
Debt securities and Subordinated debts  
Own funds  
Other liabilities

## Ranking of balance sheet totals (in EUR million)

Ranking	Bank	2019	2018	Shift	Change in rank
1	Société Générale Luxembourg S.A.	45,337	41,636	8.9%	=
2	Banque de Luxembourg S.A.	14,255	15,287	-6.8%	=
3	Société Générale Capital Market Finance S.A.	9,488	9,394	1.0%	=
4	CA Indosuez Wealth (Europe) S.A.	8,040	8,095	-0.7%	=
5	Natixis Wealth Management Luxembourg S.A.	6,331	4,386	44.3%	=
6	Banque BCP S.A.	668	662	0.9%	=
7	Banque Transatlantique Luxembourg S.A.	569	536	6.2%	=
8	Keytrade Bank Luxembourg S.A.	282	282	0.0%	=
9	Société Générale Financing and Distribution S.A.	23	116	-80.2%	=
	<b>Total</b>	<b>84,993</b>	<b>80,394</b>	<b>5.7%</b>	

## Ranking of annual net profit or loss (in EUR million)

Ranking	Bank	2019	2018	Shift	Change in rank
1	Société Générale Luxembourg S.A.	235.1	359.6	-34.6%	=
2	Banque de Luxembourg S.A.	58.5	64.1	-8.7%	=
3	Natixis Wealth Management Luxembourg S.A.	4.9	7.1	-31.0%	=
4	Société Générale Financing and Distribution S.A.	1.0	3.1	-67.7%	=
5	Banque Transatlantique Luxembourg S.A.	1.0	1.4	-28.6%	=
6	Banque BCP S.A.	0.8	1.2	-33.3%	=
7	Keytrade Bank Luxembourg S.A.	0.3	-0.1	400.0%	▲ 1
8	Société Générale Capital Market Finance S.A.	0.1	0.1	0.0%	▼ -1
9	CA Indosuez Wealth (Europe) S.A.	-16.3	-18.4	11.4%	=
	<b>Total</b>	<b>285.4</b>	<b>418.1</b>	<b>-31.7%</b>	

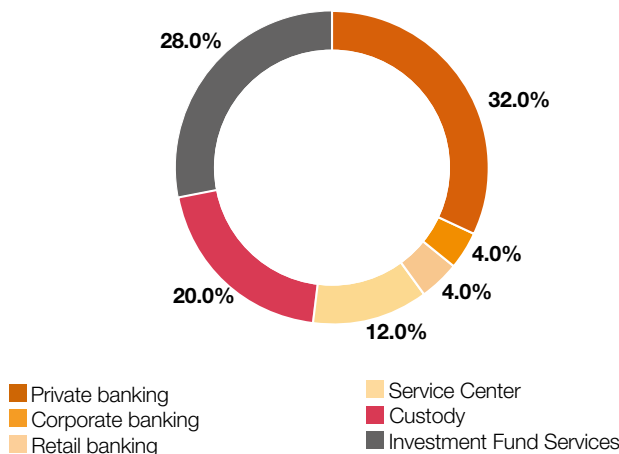
# Key takeaways – Swiss segment

- Swissquote Bank Europe S.A. (formerly called Internaxx Bank S.A.) entered the segment following the acquisition by Swissquote Group Holding Ltd. in Q1 2019. The bank was previously part of the UK/North American segment.
- The aggregate balance sheet total in the Swiss segment increased by EUR 2.5 billion (+8.4%), driven by the growth in the placements with central banks and loans and advances to credit institutions (EUR +2.6 billion; +15.8%). Credit Suisse (Luxembourg) S.A. contributed EUR 1.7 billion (+61.4%) to the overall increase through deposits with the Luxembourg Central Bank with the aim to expand its liquidity buffer and to place the cash equivalents held by clients (EUR +1.6 billion, +29.7%).
- The banking income showed an overall positive development of 1.6%. Net commission income, the key driver for the Swiss segment, increased by EUR 17.3 million (+3.5%). Six out of nine banks of the Swiss segment saw an increase, with reasons being principally acquisition of new customers and growth in Assets under Management due to a favourable stock market environment. Bank Julius Baer Luxembourg S.A. saw the largest improvement in net commission income (EUR + 10.5 million; +34.0%) resulting from strong growth in its private banking business and expansion through a new branch in Dublin.
- On the expense side, there were notable increases in staff costs (+9.2%) and administrative expenses (+3.9%). The overall headcount grew by 110 FTE (+5.1%), mainly at Pictet & Cie (Europe) S.A. (+52 FTE; +9.0%), Union Bancaire Privée (Europe) S.A. (+21 FTE; +46.7%) and Bank Julius Baer Luxembourg S.A. (+21 FTE; +8.8%). Most banks of the Swiss segment cited growing business driving new recruitment, but also projects such as rolling out new IT platforms. Pictet & Cie (Europe) S.A. saw the largest increase in staff cost (EUR +20.1 million; +15.8%) as the result of the increase in activities, such as the creation of a new branch in Monaco and the strong growth in its client assets by 17% through a combination of strong clients acquisition and investment performance.
- Aggregate prior year net profits were positively affected by Lombard Odier (Europe) S.A.'s sale of its private banking business in the Netherlands for a total of EUR 17.4 million.

## Number of banks

Number of banks	2019	2018
Subsidiaries	9	8
Branches	3	3
<b>Total</b>	<b>12</b>	<b>11</b>

## Business areas



## Annual net profit or loss (in EUR million)



## Headcount



## Cost-income ratio



## Balance sheet total (in EUR million)



## Return on equity

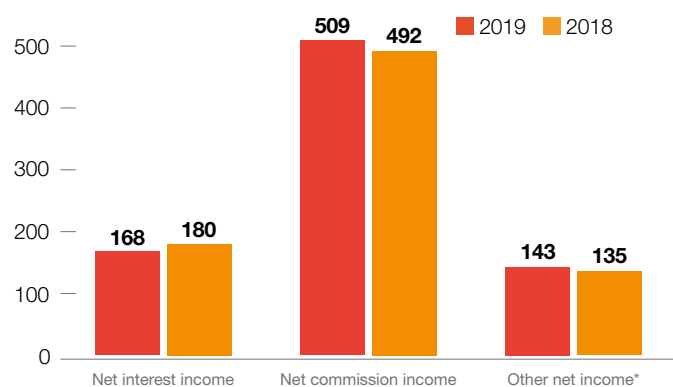


## Return on assets



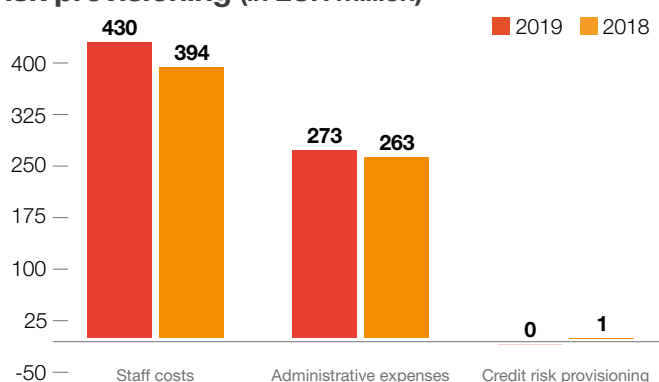


## Banking income (in EUR million)

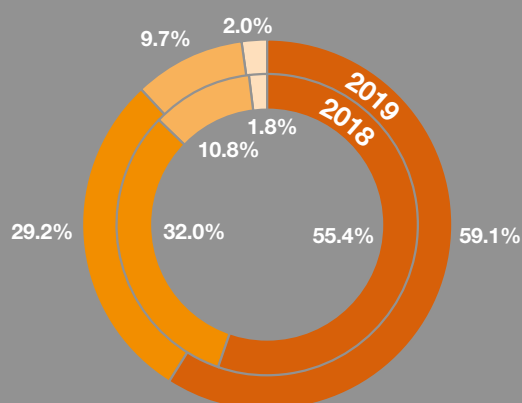


\*other net income includes: net profit/loss on financial operations (including gains/losses on derivatives & revaluation gains/losses), other net operating income and dividend income

## Staff costs, administrative expenses and credit risk provisioning (in EUR million)

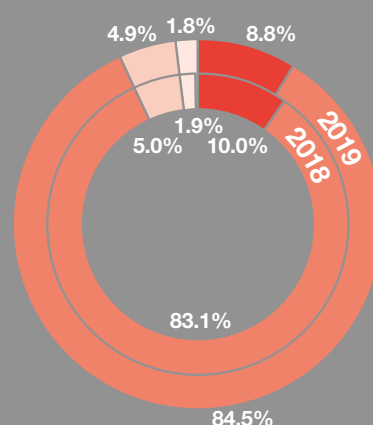


## Breakdown of assets



■ Loans and advances to credit institutions  
■ Loans and advances to customers  
■ Bonds and other transferable securities  
■ Fixed assets and their assets

## Breakdown of liabilities



■ Amounts owed to credit institutions  
■ Amounts owed to customers  
■ Own funds  
■ Other liabilities

## Ranking of balance sheet totals (in EUR million)

Ranking	Bank	2019	2018	Shift	Change in rank
1	Pictet & Cie (Europe) S.A.	9,478	9,745	-2.7%	=
2	Credit Suisse (Luxembourg) S.A.	7,886	6,183	27.5%	=
3	Edmond de Rothschild (Europe) S.A.	4,841	5,362	-9.7%	=
4	Bank Julius Baer Luxembourg S.A.	2,876	2,037	41.2%	▲ +1
5	EFG Bank (Luxembourg) S.A.	2,838	2,552	11.2%	▼ -1
6	Lombard Odier (Europe) S.A.	1,677	1,595	5.1%	=
7	Union Bancaire Privée (Europe) S.A.	1,546	1,081	43.0%	=
8	Mirabaud & Cie (Europe) S.A.	551	660	-16.5%	=
9	Swissquote Bank Europe S.A.	450	431	4.4%	=
	<b>Total</b>	<b>32,143</b>	<b>29,646</b>	<b>8.4%</b>	

## Ranking of annual net profit or loss (in EUR million)

Ranking	Bank	2019	2018	Shift	Change in rank
1	Pictet & Cie (Europe) S.A.	54.5	106.2	-48.7%	=
2	Credit Suisse (Luxembourg) S.A.	32.9	29.5	11.5%	=
3	Edmond de Rothschild (Europe) S.A.	15.1	21.9	-31.1%	=
4	Swissquote Bank Europe S.A.	2.2	2.1	4.8%	=
5	Mirabaud & Cie (Europe) S.A.	0.5	-1.8	127.8%	▲ +1
6	Union Bancaire Privée (Europe) S.A.	-0.1	0.9	-111.1%	▼ -1
7	EFG Bank (Luxembourg) S.A.	-3.8	-6.1	37.7%	=
8	Bank Julius Baer Luxembourg S.A.	-4.3	-16.9	74.6%	▲ +1
9	Lombard Odier (Europe) S.A.	-20.7	-6.9	-200.0%	▼ -1
	<b>Total</b>	<b>76.3</b>	<b>128.9</b>	<b>-40.8%</b>	

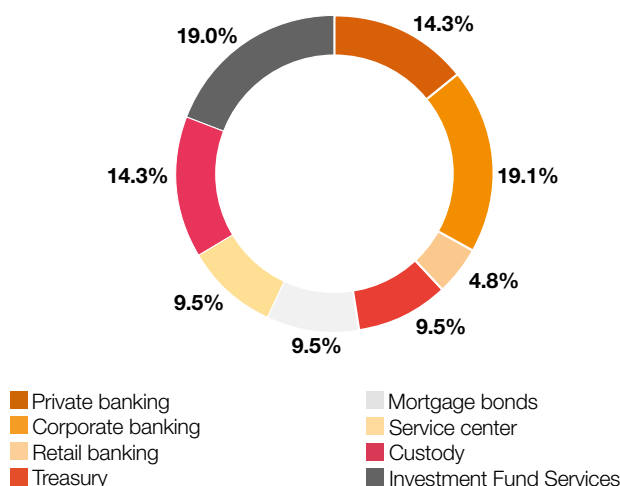
# Key takeaways – German segment

- During the year 2019, the number of subsidiaries in the German segment decreased from 9 to 7. We have assigned European Depository Bank S.A. after the finalisation of the sale to Apex Group to the Luxembourg segment. DEPFA Pfandbrief Bank International S.A. wound down its portfolio during the year and gave up its banking license in November 2019.
- The aggregate balance sheet of the German segment has decreased by EUR 7.5 billion (-9.0%) as a result of the decrease in loans and advances to credit institutions and customers. DekaBank Deutsche Girozentrale Luxembourg S.A. (“DekaBank”) transferred most of its activities to its Luxembourgish Branch during the year and plans to give up its banking license in 2020. Commerzbank Finance & Covered Bond S.A. saw its loans and advances to customers decrease by EUR 2.6 billion (-97.1%) resulting from the sale of a portfolio of receivables from UK local authorities to Commerzbank AG.
- Net banking income remained somewhat stable. On the one hand, other net income increased by EUR 7.5 million (+5.2%), on the other hand net interest income decreased slightly by EUR 21.1 million (-4.6%), remaining the key revenue stream in the German segment, as the lending activity is core for all the banks. The net commission income also decreased by EUR 18.2 million (-29.8%), EUR 12.0 million of which due to NORD/LB Luxembourg S.A. Covered Bond Bank due to increased commissions payable to other group entities.
- Looking at the cost side, most banks were able to successfully reduce costs. Staff costs decreased by EUR 8.4 million (-4.6%) and administrative expenses by EUR 5.3 million (-2.3%). However, net profits were negatively impacted by the increase in credit risk provisioning by EUR 77.1 million (+136.0%), with the largest growth recorded at Deutsche Bank Luxembourg S.A. (EUR +48.7 million, +156.6%). This was mainly driven by the concentration of the credit risk of other Deutsche Bank Group entities at Deutsche Bank Luxembourg S.A. that operates as a “centre of excellence” for lending to corporates and private institutions.
- With the headcount slightly decreasing by 77 FTE (-4.1%), staff costs decreased by EUR 8.4 million (-4.6%), again driven by DekaBank’s plan to give up the banking license in 2020 that saw a transfer of staff to its branch in 2019.

## Number of banks

Number of banks	2019	2018
Subsidiaries	7	9
Branches	13	13
<b>Total</b>	<b>20</b>	<b>22</b>

## Business areas



## Annual net profit or loss (in EUR million)



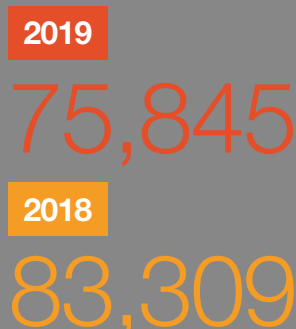
## Headcount



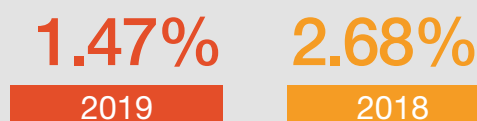
## Cost-income ratio



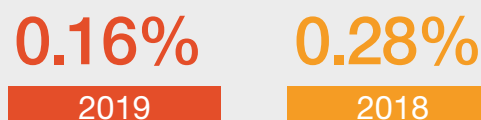
## Balance sheet total (in EUR million)



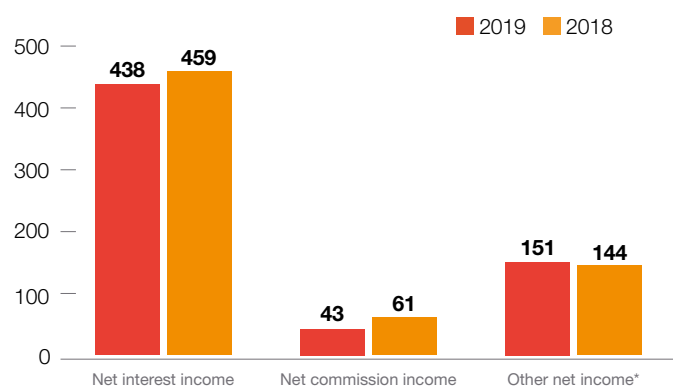
## Return on equity



## Return on assets

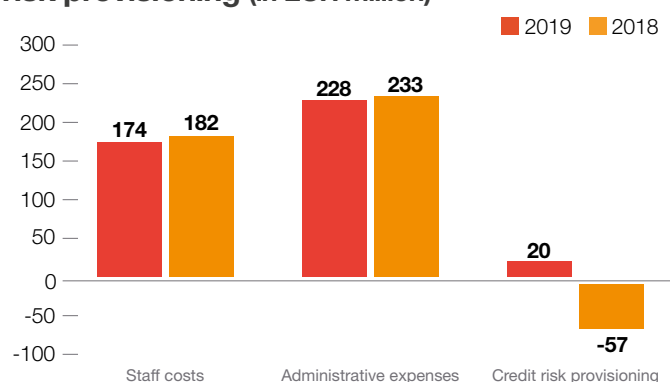


## Banking income (in EUR million)

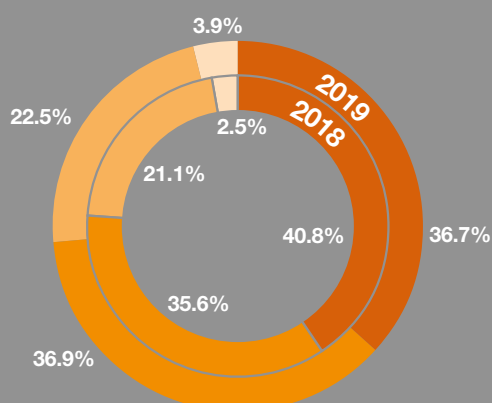


\*other net income includes: net profit/loss on financial operations (including gains/losses on derivatives & revaluation gains/losses), other net operating income and dividend income

## Staff costs, administrative expenses and credit risk provisioning (in EUR million)

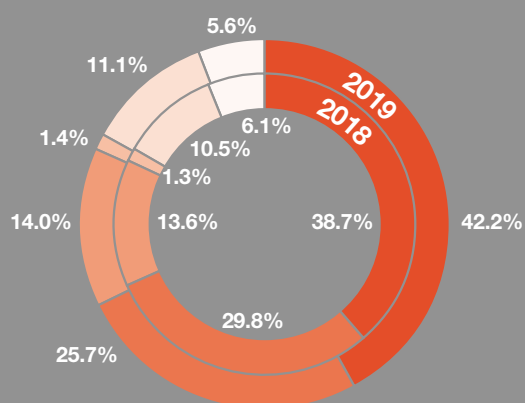


## Breakdown of assets



■ Loans and advances to credit institutions  
■ Loans and advances to customers  
■ Bonds and other transferable securities  
■ Other assets

## Breakdown of liabilities



■ Amounts owed to credit institutions  
■ Amounts owed to customers  
■ Debt securities  
■ Subordinated debts  
■ Own funds  
■ Other liabilities

## Ranking of balance sheet totals (in EUR million)

Ranking	Bank	2019	2018	Shift	Change in rank
1	Deutsche Bank Luxembourg S.A.	30,141	30,677	-1.7%	=
2	DZ PRIVATBANK S.A.	18,698	17,556	6.5%	=
3	NORD/LB Luxembourg S.A. Covered Bond Bank	15,562	17,199	-9.5%	=
4	Commerzbank Finance & Covered Bond S.A.	9,716	12,053	-19.4%	=
5	DekaBank Deutsche Girozentrale Luxembourg S.A.	960	5,016	-80.9%	=
6	HCOB Securities S.A.	728	762	-4.4%	=
7	Freie Internationale Sparkasse S.A.	40	46	-13.9%	=
	<b>Total</b>	<b>75,845</b>	<b>83,309</b>	<b>-9.0%</b>	

## Ranking of annual net profit or loss (in EUR million)

Ranking	Bank	2019	2018	Shift	Change in rank
1	Deutsche Bank Luxembourg S.A.	87.6	132.8	-34.0%	=
2	NORD/LB Luxembourg S.A. Covered Bond Bank	18.5	1.0	> 1,000.0%	▲ +3
3	DekaBank Deutsche Girozentrale Luxembourg S.A.	16.7	23.9	-30.1%	=
4	DZ PRIVATBANK S.A.	11.4	11.3	0.9%	=
5	HCOB Securities S.A.	6.6	0.0	> 1,000.0%	▲ +2
6	Freie Internationale Sparkasse S.A.	0.1	0.4	-75.0%	=
7	Commerzbank Finance & Covered Bond S.A.	-16.4	64.5	-125.4%	▼ -5
	<b>Total</b>	<b>124.5</b>	<b>233.9</b>	<b>-46.8%</b>	

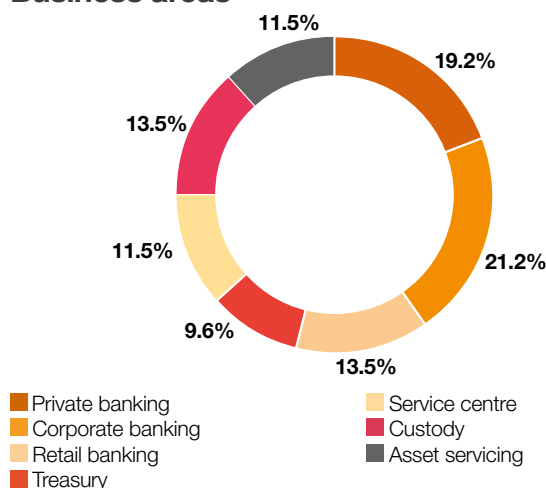
# Key takeaways – Luxembourg segment

- The Luxembourg segment is dominated by three banks – Banque et Caisse d'Epargne de l'Etat ("BCEE"), BGL BNP Paribas S.A. ("BGL") and Banque Internationale à Luxembourg S.A. ("BIL") – which in 2019 make up 82.4% of the aggregated balance sheet, 82.4% of aggregated annual net profit and 75.3% of the total staff count.
- In early 2020, KBL European Private Bankers S.A. was renamed Quintet Private Bank (Europe) S.A. Furthermore, Banque Raiffeisen S.C. merged with its 13 rural "Caisses", 2018 financials were thus restated for better comparability. Two new banks entered the segment; European Depository Bank S.A. following the sale to Apex Group and Banking Circle S.A., that originates from Saxo Payment A/S and has chosen Luxembourg as its headquarters following the 2018 change in ownership.
- The aggregated balance sheet showed another year of strong growth, increasing by EUR 7.8 billion (+5.6%). Loans and advances to customers grew by EUR 6.8 billion (+11.2%), primarily driven by the three largest banks, fuelled by the positive development of mortgage loans and business loans as reasons. In the case of BGL, the increase was largely due to EUR 2.9 billion of additional loans to other group entities.
- On the liability side, there was a notable increase in amounts owed to customers (EUR +6.0 billion; +6.2%), principally driven by a dynamism of deposit collection both for business and retail clients.
- Overall, the Luxembourg segment showed a very positive result with an overall increase in aggregated net profits by EUR 105.9 million (+20.9%), boosted by the results of BIL (EUR +86.0 million, +99.3%) and Quintet Private Bank (Europe) S.A. (EUR +83.3 million, +362.2%). Net interest income remains the key driver in banking income increasing by EUR 40.2 million (+3.2%). Net commission income increased more strongly by EUR 42.8 million (+7.8%), thanks to the positive market conditions for asset management and loan fees in line with the growth of customer loans. There was a notable increase in other net income by EUR 182.6 (+47.7%), driven by strong profits on financial operations at BCEE (EUR +31.6 million, +400%), largely due to the valuation of its investment portfolio, and BIL (EUR +65.7 million, +221.2%), mainly due to the increase in net trading income.
- On the cost side, there were notable increases in staff costs (+6.3%), whereas administrative expenses remained stable (+3.9%). The increase in credit risk provisioning stems mainly from BCEE (EUR +46.3 million), due to an anti-cyclical lump sum provision and from BGL (EUR +45.5 million), due to a net provision to the fund for general banking risks.

## Number of banks

Number of banks	2019	2018
Subsidiaries	13	11
Branches	0	0
<b>Total</b>	<b>13</b>	<b>11</b>

## Business areas



## Annual net profit or loss (in EUR million)

2019	2018
613	507

## Headcount

2019	2018
7,826	7,827

## Cost-income ratio

2019	66.7%
2018	67.2%

## Balance sheet total (in EUR million)

2019	2018
146,744	138,906

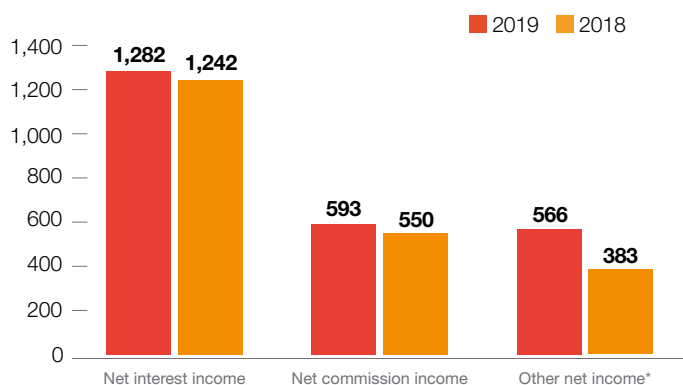
## Return on equity

4.16%	3.60%
2019	2018

## Return on assets

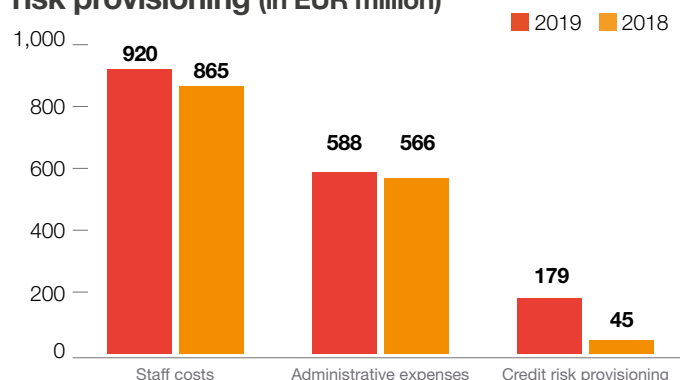
0.42%	0.37%
2019	2018

## Banking income (in EUR million)

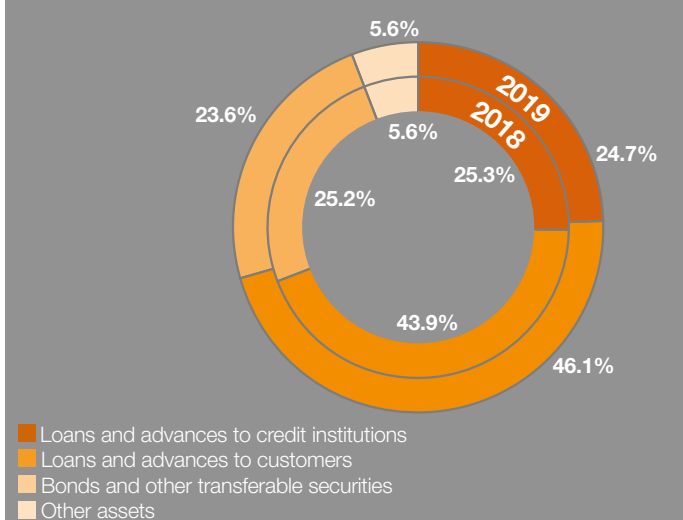


\*Other net income includes: net profit/loss on financial operations (including gains/losses on derivatives & revaluation gains/losses), other net operating income and dividend income

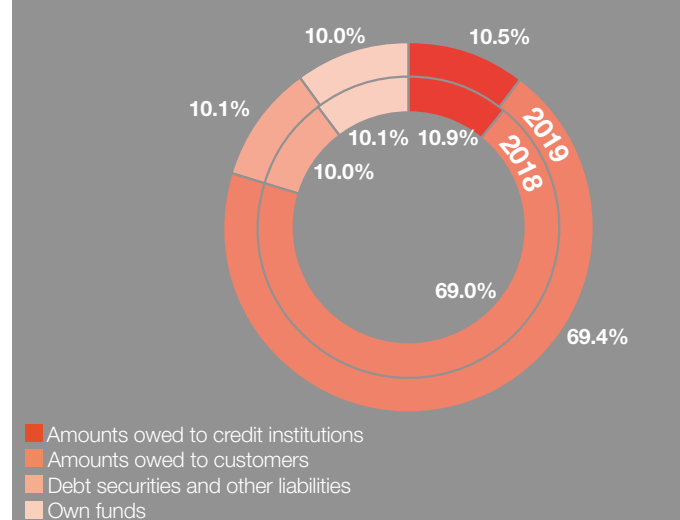
## Staff costs, administrative expenses and credit risk provisioning (in EUR million)



## Breakdown of assets



## Breakdown of liabilities



## Ranking of balance sheet totals (in EUR million)

Ranking	Bank	2019	2018	Shift	Change in rank
1	Banque et Caisse d'Epargne de l'Etat, Luxembourg	48,063	46,128	4.2%	=
2	BGL BNP Paribas S.A.	45,547	43,024	5.9%	=
3	Banque Internationale à Luxembourg S.A.	27,362	25,148	8.8%	=
4	Banque Raiffeisen S.C.	8,912	8,810	1.2%	▲ +1
5	Quintet Private Bank (Europe) S.A.	8,706	9,342	-6.8%	▼ -1
6	Compagnie de Banque Privée Quilvest S.A.	1,840	2,006	-8.3%	=
7	European Depositary Bank S.A.	1,733	1,207	43.5%	▲ +1
8	Société Nationale de Crédit et d'Investissement	1,510	1,482	1.9%	▼ -1
9	Banque Havilland S.A.	1,218	1,182	3.0%	=
10	Banking Circle S.A.	1,125	-	NEW	NEW
11	Bemo Europe - Banque Privée S.A.	385	266	44.8%	=
12	Fortuna Banque S.C.	261	271	-3.6%	▼ -2
13	RiverBank S.A.	82	40	104.3%	▼ -1
	<b>Total</b>	<b>146,744</b>	<b>138,906</b>	<b>5.6%</b>	

## Ranking of annual net profit or loss (in EUR million)

Ranking	Bank	2019	2018	Shift	Change in rank
1	Banque et Caisse d'Epargne de l'Etat, Luxembourg	183.9	175.4	4.8%	▲ +1
2	Banque Internationale à Luxembourg S.A.	172.6	86.6	99.3%	▲ +1
3	BGL BNP Paribas S.A.	148.6	209.2	-29.0%	▼ -2
4	Quintet Private Bank (Europe) S.A.	60.3	-23.0	362.2%	▲ +9
5	Société Nationale de Crédit et d'Investissement	28.3	38.9	-27.2%	▼ -1
6	Banque Raiffeisen S.C.	17.4	18.7	-7.0%	▼ -1
7	European Depositary Bank S.A.	17.3	3.4	408.8%	=
8	Compagnie de Banque Privée Quilvest S.A.	7.4	7.3	1.4%	▼ -2
9	Fortuna Banque S.C.	-1.5	0.1	< -1,000.0%	=
10	Bemo Europe - Banque Privée S.A.	-2.3	-2.7	14.8%	▲ +1
11	Banque Havilland S.A.	-3.6	0.3	< -1,000.0%	▼ -3
12	RiverBank S.A.	-4.8	-6.8	29.4%	=
13	Banking Circle S.A.	-10.3	-	NEW	NEW
	<b>Total</b>	<b>613.3</b>	<b>507.4</b>	<b>20.9%</b>	

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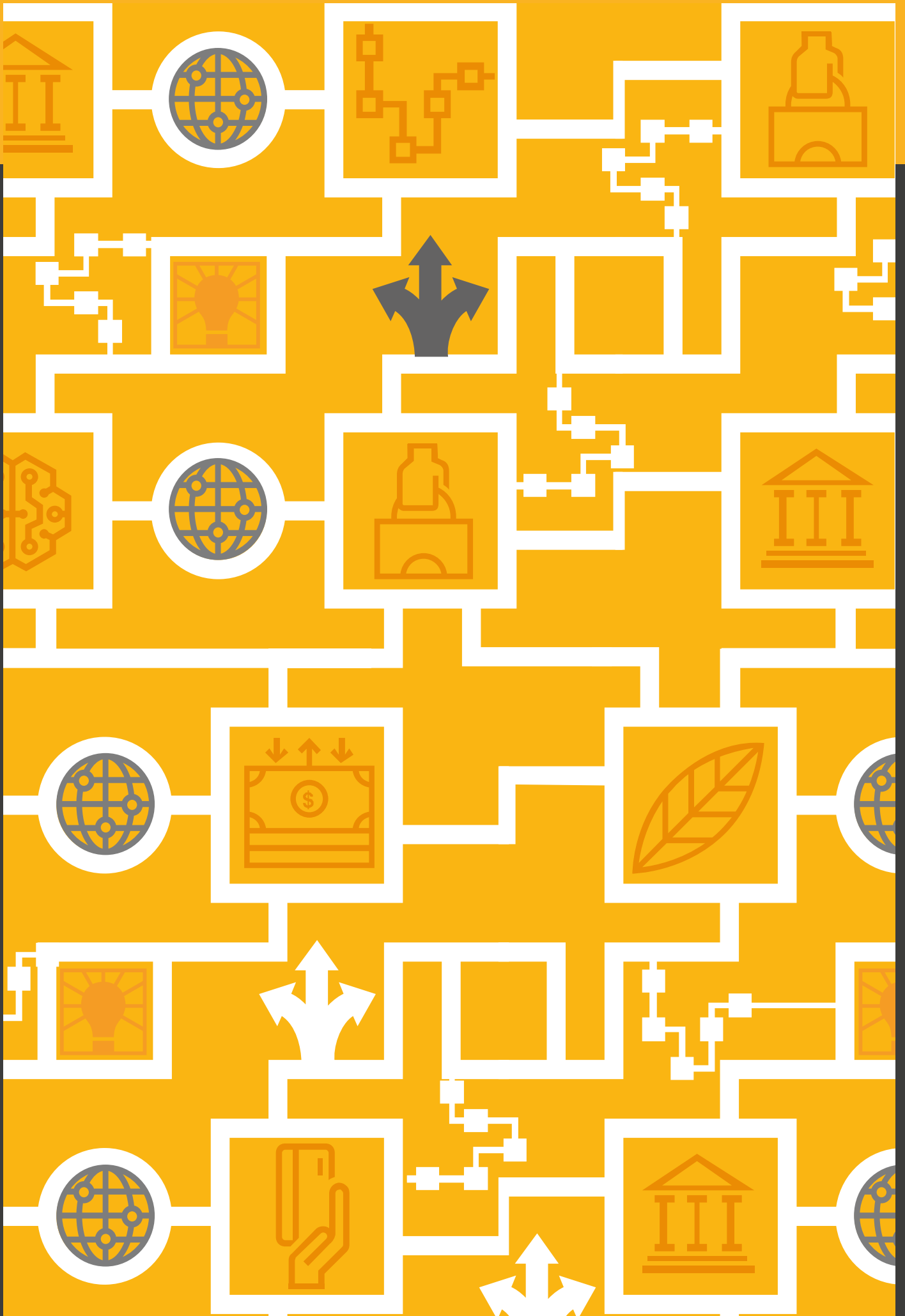
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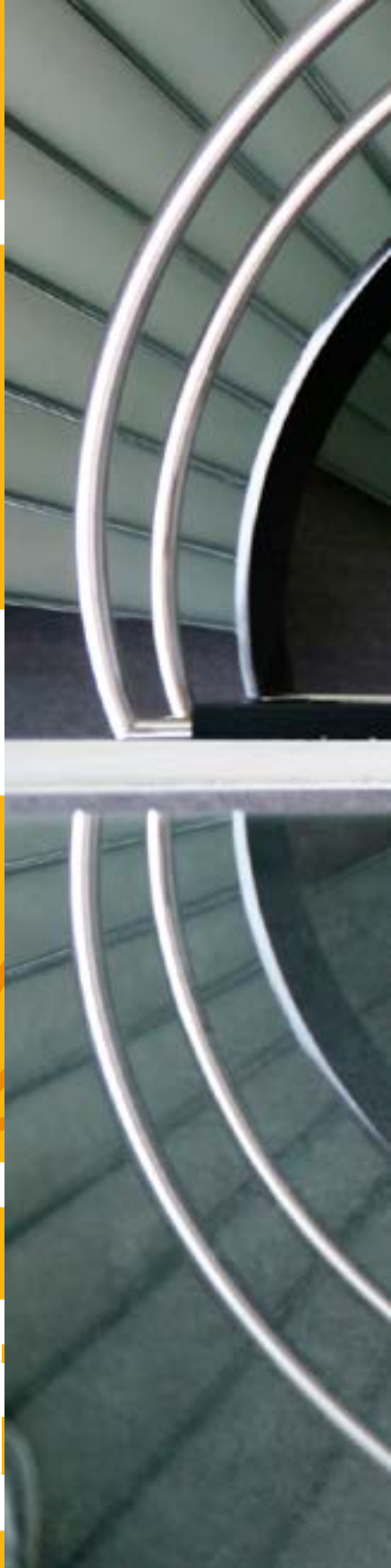
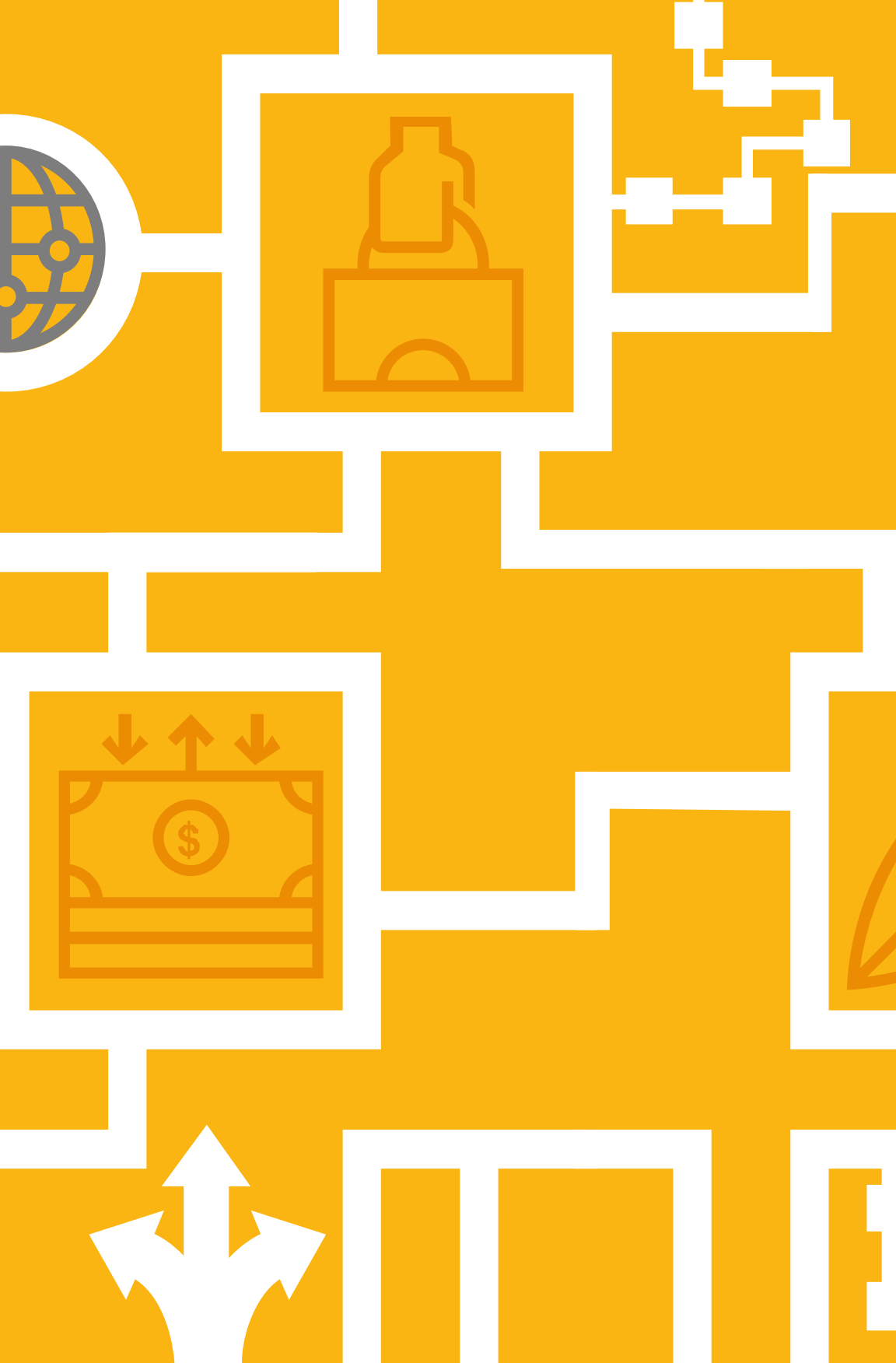


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