



WHITE PAPER

Open Banking in Germany Part I: Germany is ready for the Open Banking revolution

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Foreword



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Open Banking is no doubt one of the topics that are shaping the world of finance and payments today. It is a global phenomenon and yet happening in different ways and at different paces in various geographies. In fact, the COVID crisis has exposed the great need for further digitization, and Open Banking may well be an important tool to achieve that goal. Regardless of how the Open Banking trend materializes, we at Mastercard believe that it will fundamentally change the way consumers interact with their financial lives and with the service providers that help them.

As part of our multirail strategy, Mastercard is committed to supporting payments and data flows on all rails, for all users and all use cases everywhere in a safe, secure and efficient manner. Therefore, it is only natural for us to be keenly interested and engaged in the advancement of the Open Banking ecosystem. To this end, we have developed a comprehensive suite of services that cover the key needs of all participants in the ecosystem:

connectivity, protection from fraud and data compromise, advisory services and various additional value-added features.

To underscore our commitment, we want to make two contributions specifically to the German market as we believe that this market is next to take off after the UK when it comes to the Open Banking revolution.

First, we have initiated this research that you find before you today. Structured into two parts, it closes a number of gaps as it provides specific insights into the relevance of Open Banking services to consumers and their willingness to pay for such services. A number of our clients and partners participated as interview partners and we hereby thank all participants for their insights. With this research, we aim to provide additional inspiration and impetus for all ecosystem participants to develop superior products and services that will enhance the value propositions that they are able to offer to their customers.

Second, it is our mission to facilitate the execution of any transaction in a fast, secure and efficient manner. This holds equally for the world of cards as it does for account to account payments and a rapidly evolving Open Banking ecosystem. Our Open Banking Connect Service enables us to access the APIs of the major European Banks. Open Banking Protect ensures that only third-party providers with a valid license and certificate access client data held by banks and will be extended by fraud-prevention mechanisms that are ready

for the challenges of this new ecosystem. Please contact us if you would like to learn more about our service offering.

Best wishes,

Peter Bakenecker

Division President

Mastercard Germany and Switzerland

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Introduction

A large number of publications are addressing Open Banking as a topic and trend. What is yet another paper going to contribute?



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- First, extant analyses and commentaries usually favor one side of the ecosystem – either consumers, or account servicing payment service providers (ASPSPs), or third party providers (TPPs), etc.
- Second, extant analyses and commentaries have very specific focal points. Either they take a very general view, discussing the trend on a high level (Europe-wide, global, strategic) or they take a very narrow view (e.g. performance of PSD2 APIs in a given country).
- Third, the opportunities for commercialization are rarely explored beyond a purely conceptual discussion.

We aim to close these gaps. We focus on one country – Germany – but on the views of both consumers and other ecosystem participants (ASPSPs, TPPs). We give strategic recommendations but take into account specific market circumstances. We analyze the possibilities for commercialization of Open Banking offerings in this specific setting.

To create this analysis, we pursued a two-pronged approach. First, we ran in-depth market research among consumers together with the market research company LINK¹ with a focus on consumers' attitudes towards data, privacy, Open Banking and willingness to pay. Second, we did a number of in-depth interviews with market participants in the German Open Banking market. These cover financial service providers, IT service providers, traditional banks and emergent ones and represent various perspectives: technical, financial and disruptive.

Based on this rich set of data we extracted the most valuable and most incisive observations that paint a complete picture of the German Open Banking landscape. In doing so, we do impose one constraint on the analysis: The majority of observations is geared towards the consumer segment, leaving the business banking segment out of scope for now.

This is the first in a 2-part miniseries on Open Banking in Germany. If you are active in the market and are following the ecosystem, you will find most new insights in the second part.

If you are less familiar with the German market and Open Banking in general, we recommend starting with this first part.

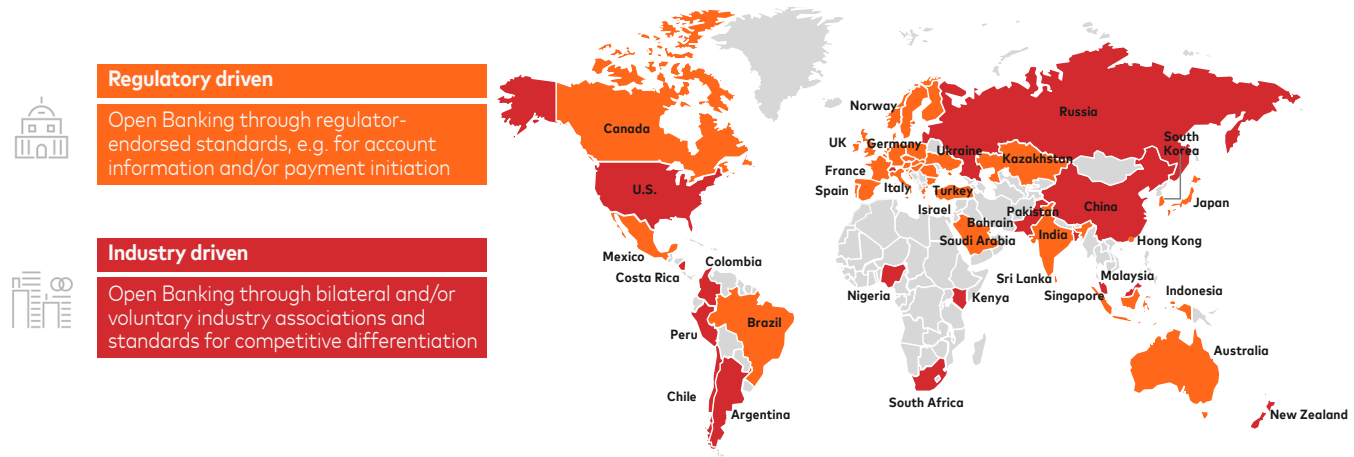
The rest of this paper is organized as follows: In the first chapter, we introduce the concept of Open Banking. In the second chapter, we consider the situation in Germany with respect to the technological legacy and current state of play in the PSD2 world. The third chapter provides a deep dive on Germany and its readiness for the Open Banking trend. Here, we consider both macroeconomic indicators, consumer attitudes and insights obtained from various conversations with market participants (ASPSPs, TPPs). The fourth chapter concludes part I and gives an outlook on the second part in the series².

¹ Target group: women and men in Germany aged 18 to 74 who use the internet for private purposes at least once a week and who own a smartphone and use it daily; sample size: n = 1,241 interviews; fieldwork: November 25th – December 1st, 2020; methodology: computer assisted web interviews.

² We thank LINK Institute for their support in conducting the field research. Further thanks go to clients and partners in Germany who shared valuable insights in a series of interviews and to Mastercard Advisors for support with structuring and analytics.

Open Banking – a trend towards a collaborative ecosystem

It is a truism that we live in a world of accelerated change. This is perhaps nowhere more true than at the intersection of financial services and technology. Here, a fundamental need of society is satisfied – the need to store and manage and – crucially – move money.



Players in the Open Banking system

Open Banking is being adopted around the world, driven by efforts to promote innovation and competition. While driven by regulation in some countries and regions, we need not look far to find initiatives that are primarily industry-driven in nature yet move towards the same objective – consider the various nascent initiatives in Switzerland as an example.

There are two fundamental trends shaping this ecosystem around the world at the moment, one being acceleration in the speed and availability of payments, the other being the democratization of access to data. There is perhaps no manifestation of the latter that is more salient than the move towards Open Banking. Open Banking is a collaborative ecosystem in which

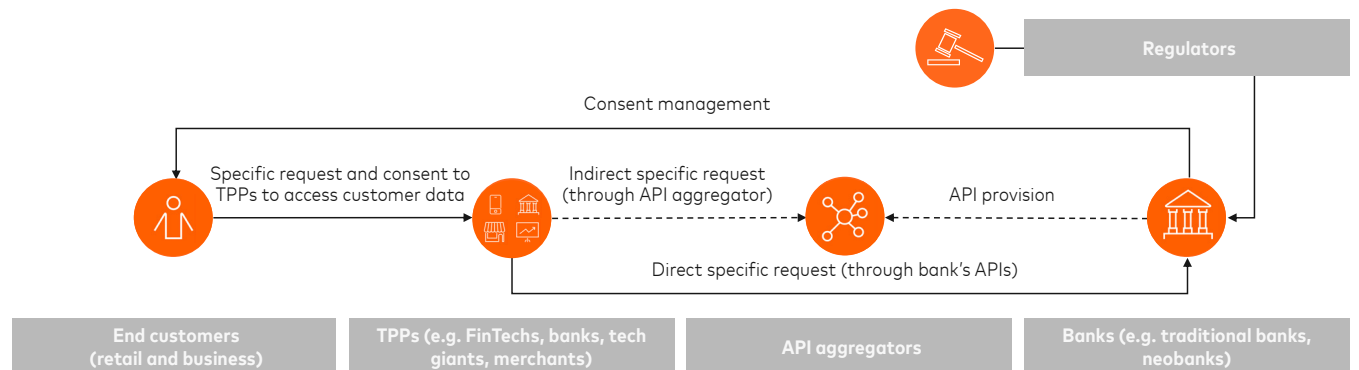
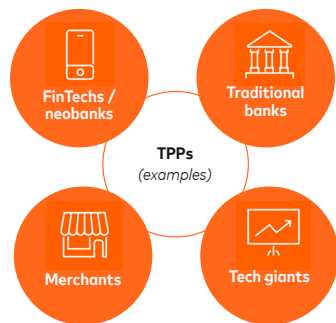
data is shared – with customer consent – among financial institutions and third party providers (TPPs) through secured application programming interfaces (APIs). This unlocks the door on better digital banking and payment services for end customers.

The lifeblood of the Open Banking ecosystem are secure application programming interfaces (APIs) which enable the interaction between the various parties. The most important among these is the end consumer – retail or business. It is their data and their accounts that underpin the entire ecosystem. And it is for them that the other players in the ecosystem have an opportunity to create new and improved services.

„The most important party in the ecosystem is the end consumer – retail or business. It is their data and their accounts that underpin the entire ecosystem.“

With their consent, third party providers (TPPs) are able to access data pertaining to accounts that are held by account servicing payment service providers (ASPSPs). TPPs obtain consumer consent for data access in exchange for innovative, more convenient or more economical services.

But TPPs are not restricted to FinTech or neobank players, they can be merchants, traditional banks, tech giants and other actors.³ Finally, a special class of TPPs, API aggregators, have specialized in the provision of technical services needed to connect to ASPSPs. In so doing, they do away with the final remaining barrier to entry in the Open Banking ecosystem.



³ In the EU they will need to have a valid license from their national competent authority, allowing them to participate in the ecosystem.

This discussion and use of terms might wrongly suggest that we are taking a PSD2-centric viewpoint but this is not the case. To the contrary, we have a broad understanding of Open Banking. For the purposes of this paper, we do not consider Open Banking as a particular set of regulations such as PSD2 in Europe. Rather, we view it as a paradigm underlying the organization of the future financial data ecosystem in a given region or country.

A large number of live use cases in other markets shows that Open Banking is alive and well and that, at its best, it goes well beyond narrowly defined regulatory confines.

Consider the UK, where in December of 2020 over 20m Open Banking transactions were daily executed with an availability exceeding 99%.

It is in markets such as these where players are starting to explore the full potential of the Open Banking concept. Consider Starling Bank who are already orchestrating a set of product and solution providers on their platform. In this way, they provide their

clients with an integrated business marketplace that ties customers to their Starling account without the need for the bank to develop each and every innovation and solution in-house.

Moreover, benefits from Open Banking are not limited to products and solutions that drive revenue or client retention. In the UK, Tesco Bank is using Mastercard's Open Banking Connect solution in order to reduce operating costs for the repayment of credit card balances.

Similarly, consider the partnership between BBVA and Uber in Mexico. BBVA launched a banking product that operates the

Uber app. Without leaving the Uber app, Uber drivers can quickly and easily create a digital Uber account linked to the international 'Driver Partner Debit Card' and directly receive their earnings within minutes.

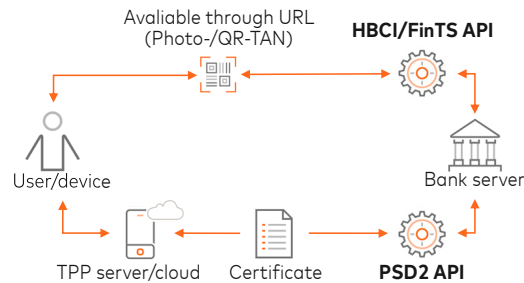
Players need to think big in terms of the scope of their solutions while identifying the right customer use cases or internal pain points that can be addressed with Open Banking. But what is the state of play in Germany?

„Players need to think big in terms of the scope of their solutions.“

A first look at Germany

None of this is new. Especially not in Germany. Here, long before Open Banking was a trend, proprietary, local account access standards allowed access to consumer and business financial data, well beyond what is within the scope of PSD2 today.

HBCI/FinTS vs. PSD2 APIs⁴



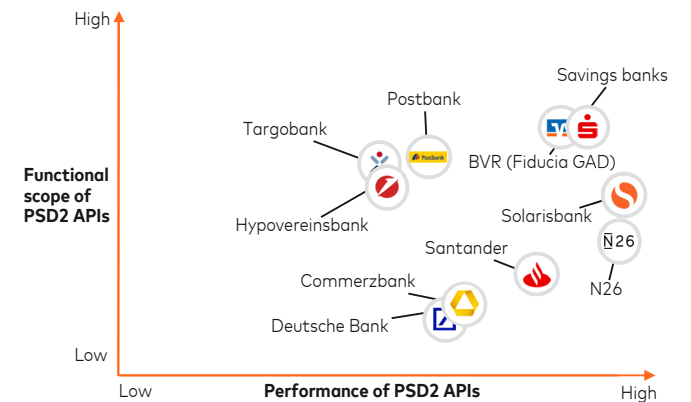
This does not refer to screen scraping, the practice of retrieving financial data, where the TPP overtly or covertly operates as the consumer. This refers to more sophisticated standards, for instance FinTS. These standards remain, some weaknesses notwithstanding, in broad use today as an additional tool in the toolbox of TPPs wishing to act in Germany due to the greater richness of data that they provide and due to their robust functionality which still makes them the access mechanism of choice for many TPPs.

In fact, appropriate permissions given by the national competent authority (BaFin) would enable German ASPSPs to prevent TPPs from accessing customer accounts by any means other than PSD2 APIs. It is a frequently stated opinion that ASPSPs' interests are best served by opening access as little as possible. Thus, one might suspect that ASPSPs would focus on obtaining the permission to make the PSD2 APIs the only access mechanism as soon as possible. The first interesting finding that emerged from our conversations with market participants was that there does not seem to be a broad-based move towards closing down legacy account access mechanisms.

Perhaps this is due to the legacy of more openness present in the German market, perhaps it is due to the realization that ASPSPs are becoming more, not less, attractive to consumers as a result of opening up. Presently the legacy access mechanisms retain a level of relevance not least because the PSD2 APIs are not yet functioning in a fully satisfactory manner for all ASPSPs. While the main ASPSPs in the market do comply with the basic requirements,

not all have received the regulator's stamp of approval at the time of this writing.

In fact, independent analysis by IT Finanzmagazin and FinTecSystems shows that, evaluated along indices of performance and functional scope, many of the major financial service providers do not yet obtain perfect scores.⁶



Source: IT Finanzmagazin and FinTecSystems⁵

⁴ See Heise Online, October 2020, and IT Finanzmagazin, March 2020.

⁵ See IT Finanzmagazin, October 2020.

⁶ "Germany Country Report 2020", Verisk Financial Research (2019 market shares by debit card numbers).



Encouragingly, however, the savings banks and cooperative banks together with major neobank players lead the pack. Savings banks and cooperative banks alone account for over 60% of issued debit cards in the market .

A combined session of an account information and a payment initiation service (AIS+PIS) with only one strong customer authentication (SCA) remains a key pain point – it is not yet offered by any of the financial institutions considered in the

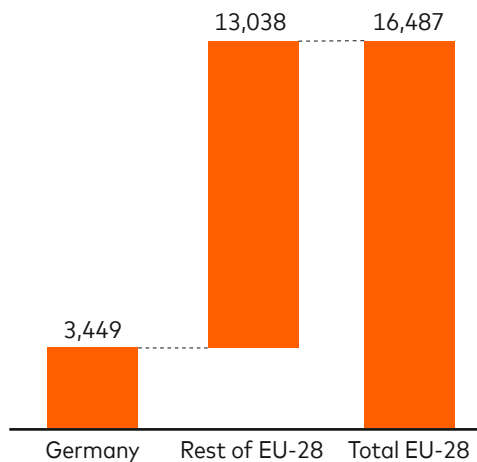
analysis. Although a combined session is not mandatory as per PSD2, it plays an important role for improving the customer experience. Another pain point is related to the account holder's overdraft limit which is currently not shared by any of the financial service providers considered in the analysis with the exception of Solarisbank. Moreover, the PSD2 APIs' productive availability of multiple financial service providers still has some room for improvement.

„A combined session of an account information and a payment initiation service with only one strong customer authentication remains a key pain point for TPPs.“

Open Banking readiness in Germany

Germany is often seen as digital backwater, where distrustful consumers cling to their data and prefer to pay in cash rather than electronically for fear of data misuse.

GDP of Germany and the EU-28 countries in 2019 (in billions of euros)⁷



This stands in stark contrast to the high degree of digital readiness that we find in the country relative to European and global peers. Moreover, the sheer size of the economy ensures the interest of financial service providers in Germany as a market.

Macroeconomic indicators of Open Banking readiness

This attractiveness is evidenced not least by the large number of TPPs – both home-grown and those that are passporting their license to Germany from other European countries. In this respect, Germany is second only to the UK. In December 2020, 35 locally authorized TPPs operated in Germany with a further 107 passporting from other European countries.⁸ However, growth rates in the German ecosystem are less dynamic compared to other European countries such as the UK, Estonia, Sweden, France, etc. where the number of TPP registrations between December 2019 and December 2020 grew faster.

A better assessment of the readiness of the German market for Open Banking is perhaps obtained by considering the digital development of the country. A convenient metric that can be useful here is the Digital Intelligence Index (DII)⁹. The index, which charts the global digital development, is a result of the collaboration between The Fletcher School at Tufts University and Mastercard. The DII shows that Germany compares favorably with its European peers and that the digital readiness in the country is certainly far from low. Based on the Digital Evolution score, the foundational measure of the DII, Germany is among the countries in Europe that are both highly digitally advanced and exhibit high digital momentum. These countries are considered leaders in driving innovation, building on their existing advantages in efficient and effective ways.

⁷ "GDP and main components (output, expenditure and income)" – Eurostat database.

⁸ Numbers as of December 8th, 2020.

⁹ "Digital in the Time of COVID – Trust in the Digital Economy and Its Evolution across 90 Economies as the Planet Paused for the Pandemic" (December 2020) – Report by the Fletcher School at Tufts University.

**Digital Evolution state
across European countries**

Rank	Country	Score
1	Finland	87.30
2	Denmark	87.17
3	Switzerland	86.89
4	Netherlands	85.48
5	Norway	85.34
6	Sweden	85.07
7	Iceland	84.29
8	UK	81.48
9	Germany	79.27
10	Estonia	76.66
11	Austria	75.42
12	Belgium	74.51
...	<i>Other European countries</i>	...
32	Azerbaijan	51.85
33	Ukraine	46.03
34	Bosnia & Herzegovina	39.65

**Digital Evolution momentum
across European countries**

Rank	Country	Score
1	Azerbaijan	65.28
2	Georgia	60.72
3	Russia	58.90
4	Poland	57.29
5	Bulgaria	55.02
6	Lithuania	54.21
7	Latvia	52.82
8	Serbia	51.16
9	Czechia	50.89
10	Ukraine	49.21
11	Estonia	48.97
12	Germany	48.28
...	<i>Other European countries</i>	...
32	Austria	36.40
33	Belgium	36.17
34	Sweden	33.86

→ Digital Intelligence Index (DII)

The Digital Intelligence Index (DII) platform is built to encompass several scorecards measuring various aspects of the global digital economy such as digital evolution and digital trust. As the foundational measure, the Digital Evolution scorecard tracks the state and historical momentum of 90 economies – comprising 95% of the world’s online population – over twelve years (2008-2019). It measures 160 indicators across four key pillars: institutional environment, demand conditions, supply conditions and the capacity for innovation and change. The Digital Evolution scorecard defines a framework that captures on a scale from 0 to 100 both the state and rate (momentum) of digital evolution.

„Accelerated by the COVID-19 pandemic, even Germans' notorious love for cash has cooled off somewhat.“



9%

of consumers visit a bank branch at least once a week¹¹



49%

of consumers use online banking with a computer at least once a week¹¹



39%

of consumers use mobile banking on a smartphone at least once a week¹¹

Accelerated by the COVID-19 pandemic, even Germans' notorious love for cash has cooled off somewhat. A Mastercard study¹⁰ finds that 65% of Germans substantially increased use of digital payments during the pandemic. Moreover, 35% indicated that they would continue this elevated use of digital payments. This figure was even higher among the demographic

70 years+, where 46% suggested the same. The driving force in this instance is availability of contactless and mobile payments.

Taken together, these findings suggest a high degree of readiness and momentum for finance initiatives that have a mainly digital focus, such as Open Banking, to take hold in Germany.

Consumer attitudes

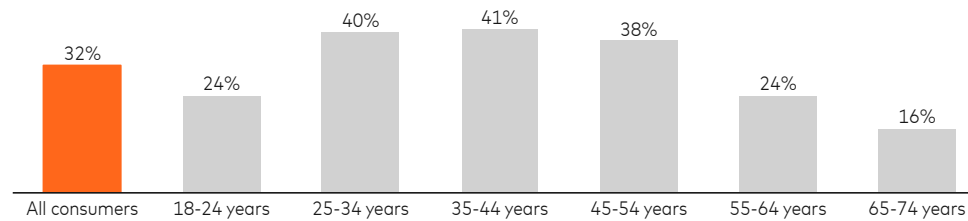
In order to understand in greater detail consumers' likelihood to take advantage of Open Banking-related products and services, we explore affinity to digitalization in our consumer sample. Our sample is representative across important demographic factors such as gender, age, region and income. Through weighting we achieved representativeness even by primary banking relationship. While our sample is restricted to Germany, thus making comparisons with European peer groups impossible, taken together with the broader socio-demographic indicators listed above, we hope to obtain a reliable indicator of Germans' digital affinity.

¹⁰ „Payment trends in retail 2020“ - GfK study on behalf of Mastercard (July 2020).

¹¹ Question: "How frequently have you used the following channels for your banking business in the past 12 months?"



Share of consumers who purchase products online (on a computer or smartphone) at least once a week¹²



For some anecdotal evidence consider that 2/3 of our respondents had installed more than 10 apps on their smartphones, 1/3 have and use more than 20. Unsurprisingly, it is the younger demographic of 18-24-year-old consumers that are especially prolific users (54% have more than 20 apps on their smartphones).¹³ 39% of respondents indicated that they use mobile banking at least once a week, almost 50% of respondents use online banking with a computer at least once a week. While the first indicates advances in digitalization, the latter might be a

double-edged sword – in an increasingly mobile-centric ecosystem the question remains what the relevance of online banking from a computer will be. We choose to interpret this data point as an indicator of a high level of comfort with digital financial services – especially as compared with a very low frequency of physical bank visits. Another important indicator is the propensity for e-commerce, where upwards of 40% of 25-44-year-old consumers in our sample use this shopping channel at least once a week.

¹² GfK study on behalf of Mastercard (July 2020) - Question: "How frequently do you purchase products online (on a computer or smartphone)?"

¹³ Our interpretation of the number of apps assumes that these are apps going beyond operating system standard and being regularly used.



1.7

banking relationships on average¹⁴



6.3

banking products on average¹⁵

In essence, Open Banking is geared towards allowing greater ease in managing multiple financial products and banking relationships.

Thus, providers will be keen to understand consumers' banking habits and level of trust and comfort with their financial data.

Regarding consumers' banking habits, the main reasons for maintaining more than one banking relationship are highly consistent with the logic of Open Banking. Primary reasons include differences in product offering or terms & conditions from different banks as well as the greater ease of managing one's finances offered by some banks. On average, consumers in our sample have 1.7 banking relationships.

The average consumer uses 6.3 banking products. The most common obviously being a current account (95% of the consumers in our sample use one) and various payment instruments linked to that account. More complex financial products such as

mortgages, pension plans and investment accounts are held by about 1/3 of the sample. Likely due to lower and less steady levels of income, the more digital, younger consumers (18-24-year-olds) use a lower than average banking products (4.9 on average per consumer). This important number of future customers will need to be captured with Open Banking use cases that do not require a highly complex financial life. For example, building a universal marketplace for customers will allow them to use their mobile banking app also far beyond banking services such as paying for parking, ordering food or buying tickets for public transportation. This use case can be particularly attractive for the group of 18-24-year-old consumers who are characterized by their use of a large number of mobile apps for various services.

Data sharing and trust

Germans are very private when it comes to their data. This makes trust an essential asset in the marketplace for Open Banking

¹⁴ Calculated based on the question: "At which of the following banks / financial institutions are you currently a customer?"

¹⁵ Calculated based on the question: "Which and how many of the following banking products do you currently use?"



Share of consumers who have concerns related to sharing data with non-banks¹⁶

Top concerns:

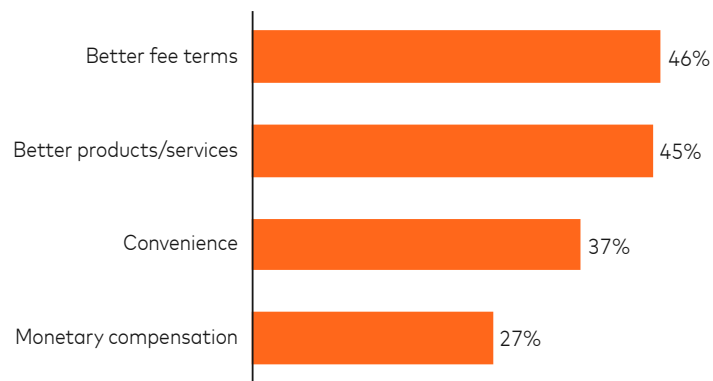
1. My financial data could be misused and I could lose money.
2. My financial data will not be secure at non-banks.
3. Non-Banks will use financial data for commercial purpose.

products and services. 82% have concerns when it comes to sharing data with non-banks. These concerns are primarily driven by loss of money, misuse and reselling. This reluctance to share data prevails for some consumers regardless of what detail of information regarding data use and security is provided: 30% of

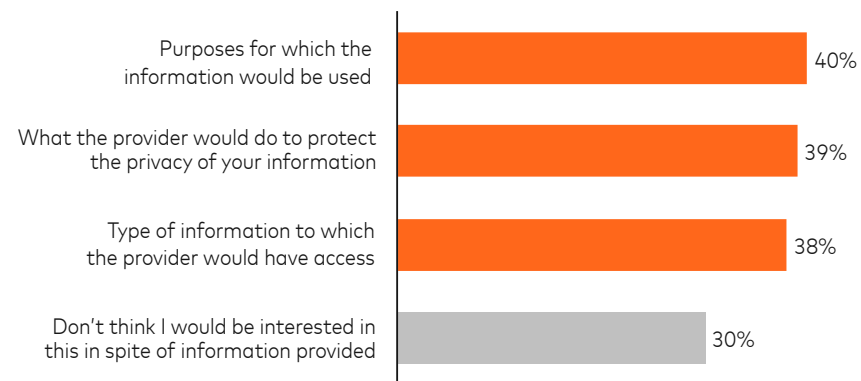
consumers cannot be satisfied by any level of disclosure – they will still not share their data. At the same time, among those who would consider sharing their data, there is a clear expectation of reward – financial or otherwise (e.g. better user experience or product quality) - for doing so.

While many of the new and emerging products and solutions are provided by TPPs, frequently FinTechs, it is the established players like banks and card schemes that enjoy a high level of trust when it comes to sharing data, payment initiation and new products. Interestingly, this attitude is extremely homogeneous across both

Why would you share your personal financial data with your primary bank / a third-party provider?



What information would you need to consider sharing your financial data with a provider (bank / third-party entity)?



¹⁶ Question: "Do you have concerns about sharing your financial data with non-banks and / or about allowing non-banks to make payments on your behalf and with your express permission?"

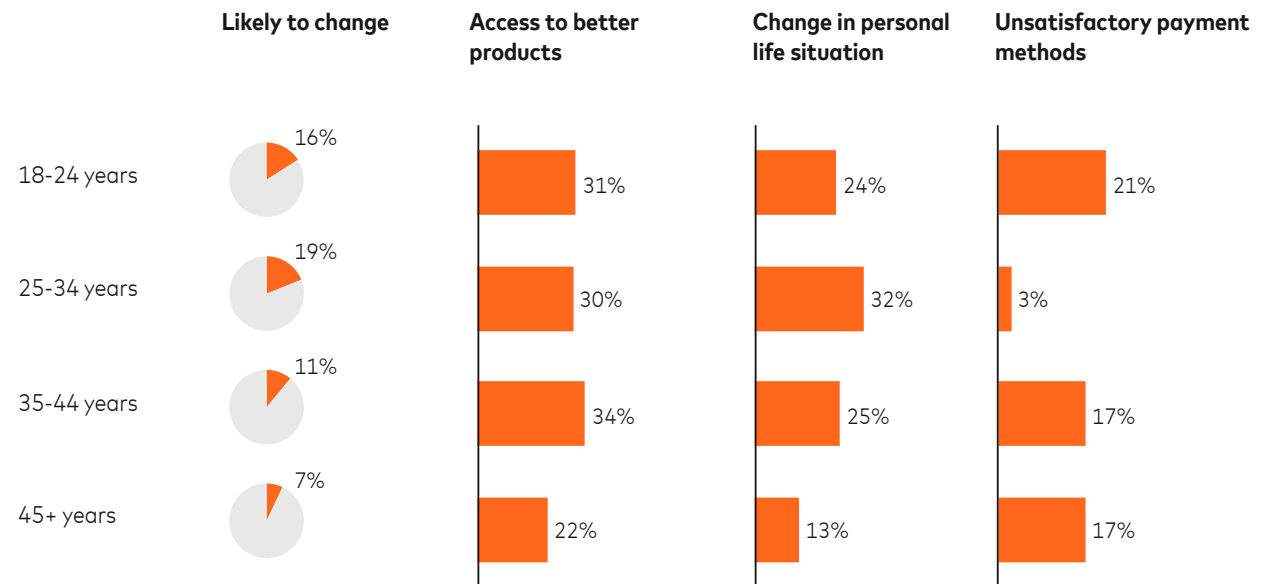


„It will be crucial to explain the added value of the solution to the customers and to make the data exchange secure and transparent.“

different age and different income groups. This finding indicates that traditional banks in Germany are in pole position in the new race for the customer interface that has been set off by the Open Banking movement. However, they cannot rest on their laurels.

While customers are in general reasonably satisfied with their primary bank and only few are considering switching, the greatest willingness to switch is found among the younger demographics – the coveted customers of tomorrow. This willingness is further increased by shortcomings in the bank’s product lineup, occurrence of life changes and quality of supported payment experience. And, we will show these results in greater detail in part II, it is Open Banking-related services that are a key incentive to switching account relationships.

How likely will you be to change your primary banking relationship in the next 12 months and why?¹⁷



¹⁷ Questions: "How likely will you be to change your primary banking relationship in the next 12 months?"; "Why do you think it is (rather) likely that you will change your primary banking relationship in the next 12 months?"; the shown share of consumers who are likely to change their primary banking relationship in the next 12 months refers to consumers who have given the answer "very likely" or "rather likely" to the first question above.

Attitudes of market participants

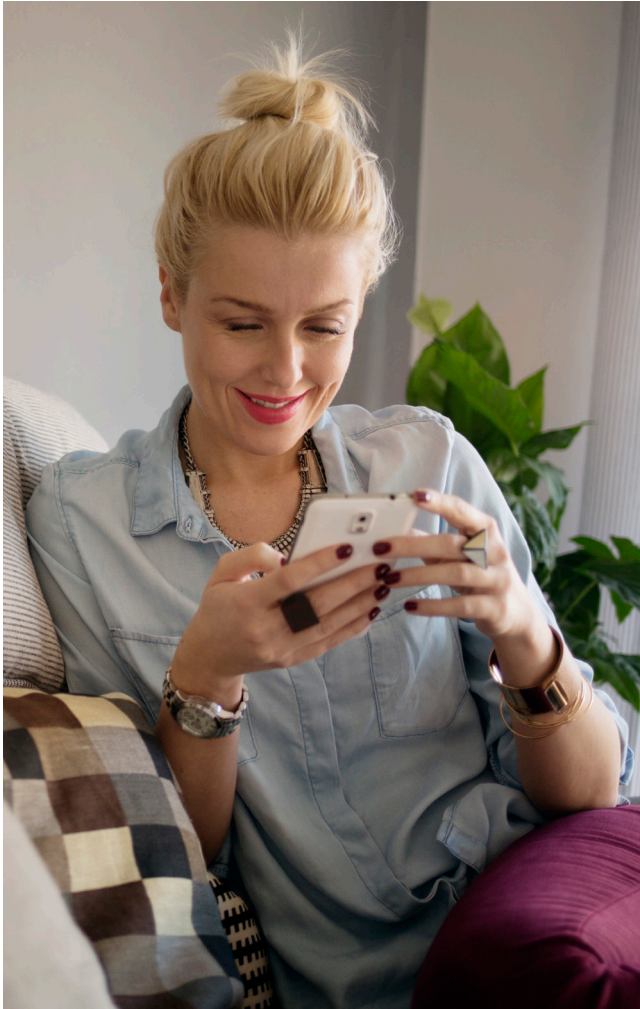
As part of our analysis, we also conducted a number of in-depth interviews with selected market participants. Taken together, the organizations we consulted on Open Banking cover the vast majority of current accounts in Germany. Moreover, they represent both incumbent and emerging ASPSPs as well as more technology-focused TPPs. Therefore, we feel comfortable in deriving a number of insights.

A The market needs to mature further

There is a balance between the view that Open Banking is an opportunity and that it is a threat, with most players seeing a fairly even mixture. Generally, maturity of Open Banking in the market in terms of products and solutions is seen as nascent with the expectation of a strong evolutionary push in the coming years. In this context, it will be key to explain the value of the solution to clients, not the mechanism behind it. This is supported by the findings of our consumer research: While fewer than 10% of respondents are familiar with the term "Open Banking", the likelihood to use Open Banking services when explained specifically is high – generally upwards of 40%.

B Data-driven business models

An important shared belief is that data-driven business models will take over from more traditional product-driven business models in the mid to long term. Therefore, it will be key for data sharing and usage practices to be made transparent and to be incentivized appropriately in order to alleviate consumer concerns over security and data privacy. Industry leaders differentiate themselves by their access to data and analytics capabilities.



C True Open Banking requires standards and options
From the point of view of the breadth of services, interview participants see the limited nature of PSD2. Progress is generally perceived as limited when compared to some of the legacy access mechanisms specific to the German market. Overall, while seen as a catalyst for API development and digitization, the primary perception of PSD2 regulation is seen as a challenge more than an opportunity. This is mainly due to a lack of technology standardization.

D Digital Giants are the competitors of tomorrow
Competition is seen as coming primarily from banks in the short term and mainly from digital giants in the long term. To counter this pressure, market participants are currently largely focusing on collaboration. Whether it is TPPs partnering with banks, banks partnering with consultancies or research organizations or using new and innovative partners altogether – this is the direction that the industry is taking.

Overall, market participants have dealt with the reality of PSD2 and used it as a springboard to accelerate their digital transformation, taking a collaborative approach. While the path may be winding and steep, the direction is clear.

First conclusions and insights of part I

What can we learn so far? For the first part of this two-part series we want to leave you with five main takeaways:

- 1 We should expect a rapid evolution of Open Banking-based use cases in Germany over the next 12-18 months as functional improvements in the performance of APIs facilitate go-to-market solutions. This supply, in turn, will create its own demand.
- 2 This demand is most likely to take effect among the younger and more affluent consumers – arguably some of the most attractive customer groups out there.
- 3 Increased demand for Open Banking-based services will increase the load on exposed APIs and will also drive further need for ASPSPs to have well-established processes to ensure the safety of their data as the number of TPPs accessing it grows.
- 4 Banks are well-positioned in terms of customer trust – an important factor for many to share their data – but their innovation pace will need to pick up in order to translate this advantage into business success.
- 5 Collaboration is the name of the game when it comes to (re-)claiming the right to win the consumer interface in the Open Banking ecosystem.

This, of course, begs the question whether it is all worth it and if we can expect sufficiently significant monetization opportunities for ASPSPs to direct their efforts in this direction. We will go some way towards answering this question in the second part of our miniseries.

Appendix

1,241 consumers, who use the internet for private purposes at least once a week and who own a smartphone and use it daily, were questioned in a field research from November 25 to December 1, 2020. The computer assisted web interviews were conducted by LINK Institute.

