Strong Customer Authentication and conversion rates in Europe in 2021

European and Italian data for the first quarter of 2021

Axerve · Whitepaper

Contents

Online sales worldwide: trend forecasts 2021-2025

While **2020 was a year of double-digit growth for online sales** - for some, not all, growth was even in the triple digits, as highlighted in our article on the [changes in Italian consumers during the first lockdown](#) - **2021 will be remembered for the implementation of the European PSD2 regulation** which, with the introduction of Strong Customer Authentication (SCA) or 2-factor authentication, has revolutionised the online shopping experience.

The implementation of the new European legislation was introduced against a backdrop of growing online sales worldwide. The positive trend shown in Figure 1 has been going on for some time and, according to forecasts that already take into account the effects of the current pandemic, will continue in the years to come.

Although slowing slightly, **global online sales have grown** steadily since 2014 and are forecast by eMarketer (Figure 1) to **exceed $6 trillion** globally **in 2025**.

The analysis of online sales revenue growth by segment (Figure 2) shows a projected **Compound Annual Growth Rate (CAGR) of around 6.29%**

Retail e-commerce sales worldwide from 2014 to 2024 (in billion U.S. dollars)

Year	Sales in billion U.S. dollars
2014	1.336
2015	1.548
2016	1.845
2017	2.382
2018	2.982
2019	3.354
2020	4.280
2021*	4.891
2022*	5.424
2023*	5.908
2024*	6.388
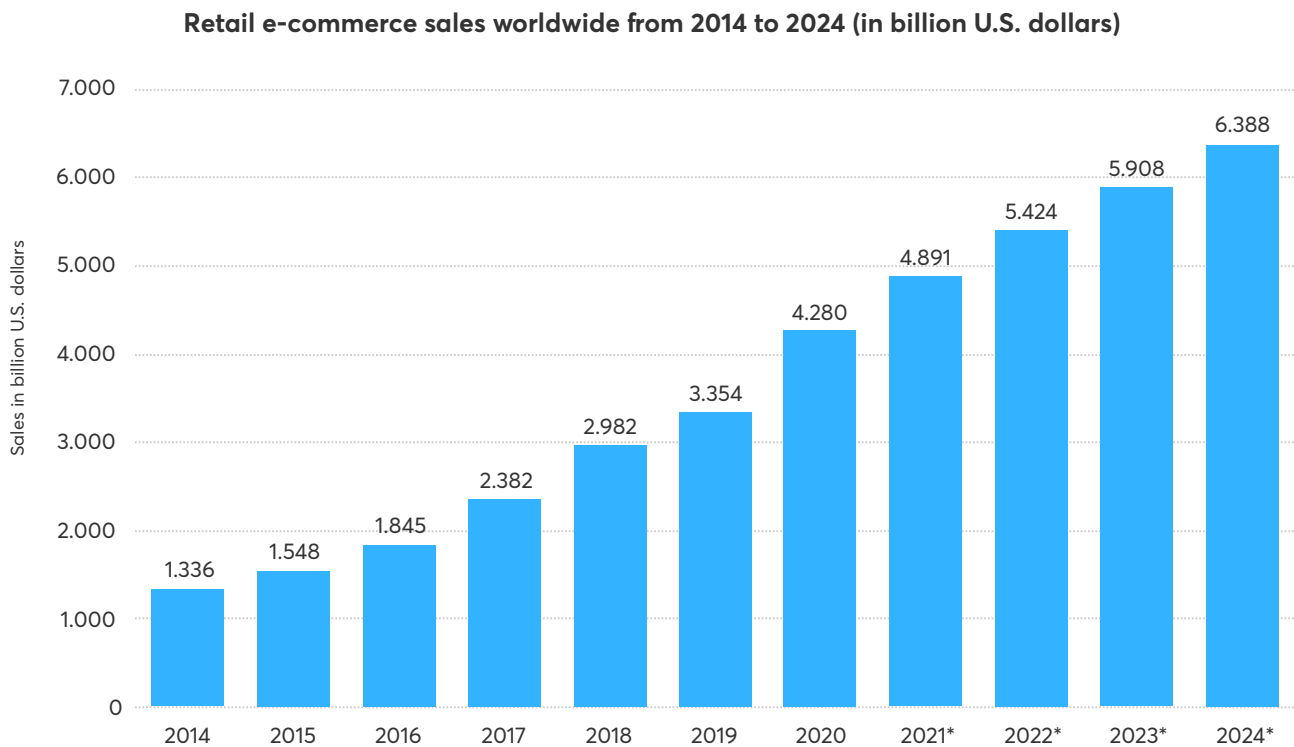
Figure 1
Source: eMarketer, 2014 - 2024 (*data published in December 2020)

over the period 2021-2025, on a projected market volume in 2025 approaching $3.5 trillion.

The increase in sales and revenues goes hand in hand with the **penetration of Ecommerce** in the world's population: expected to be **50.8% in 2021** and rising to **63.1% in 2025**. The **Average Revenue Per User** - ARPU - is the only figure that, again according to Statista's analysis, will fall slightly over the five-year period, from its peak of **$719.63 in 2022 to $707.64 in 2025**.

Looking at the individual segments covered by the statistics, the highest expected growth is in **fashion**, as shown in Figure 2, whose market volume will reach almost **$760 billion in 2021 alone**.

eCommerce - Revenue by Segment
million USD (US$) (Worldwide)
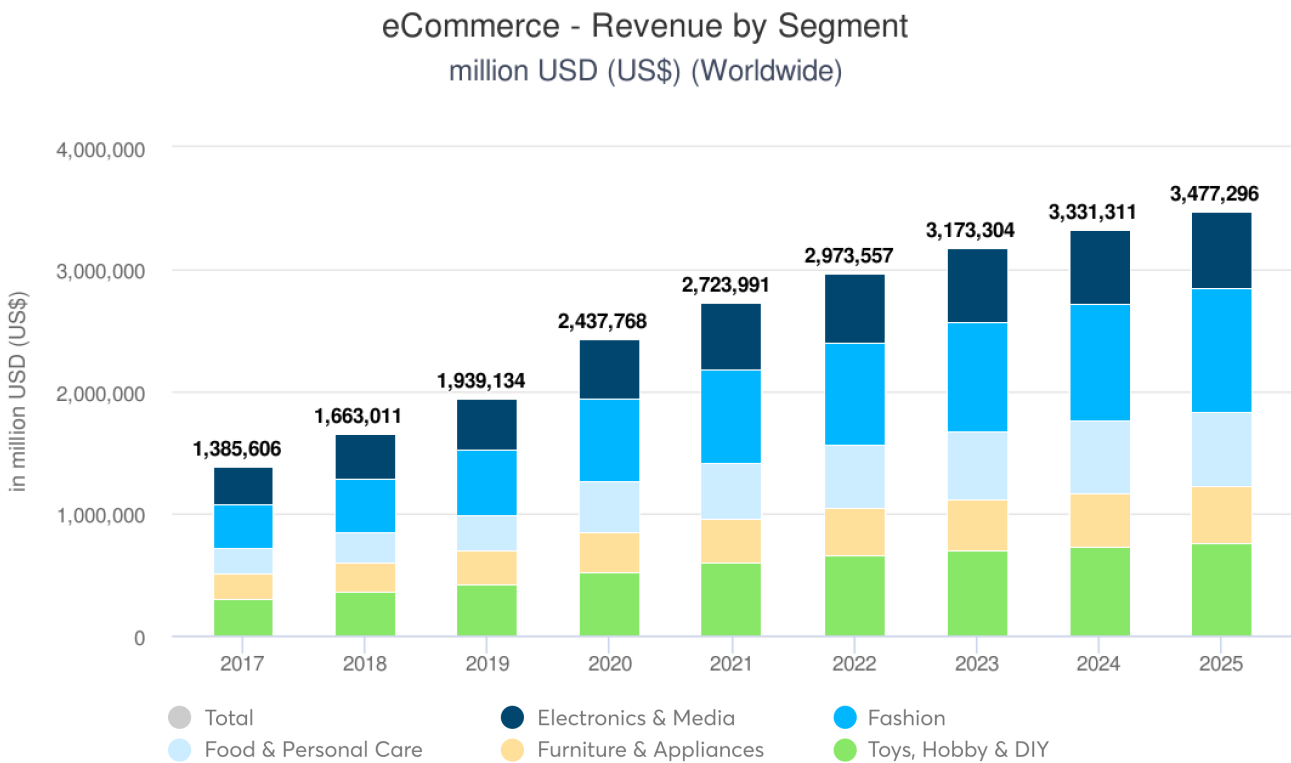
Figure 2
Source: Statista, 2021

Ecommerce in Europe: forecasts for the next five years

European Ecommerce revenues are also expected to grow. Also taking into account the 'COVID effect', the forecast for **2021 is €412 billion** (Figure 3) and the annual increase (CAGR) over the period **2021-2025 will be 5.16%**, leading the whole market to reach volumes of **€504 billion in 2025**. On the old continent too, the segment that will drive the entire market will be fashion, with volumes expected to be **around €127 billion in 2021**.

Online sales penetration per user will reach **59.7% in 2021** and reach **67.1% in 2025** (Figure 4). **Average revenue** per user (ARPU) in Europe will reach **€812 in 2021**, rising to **€884 in 2025** (Figure 5).

eCommerce - Revenue by Segment
million EUR (€) (Europe)

Figure 3
Source: Statista

eCommerce - Penetration Rate by Segment
percent (Europe)
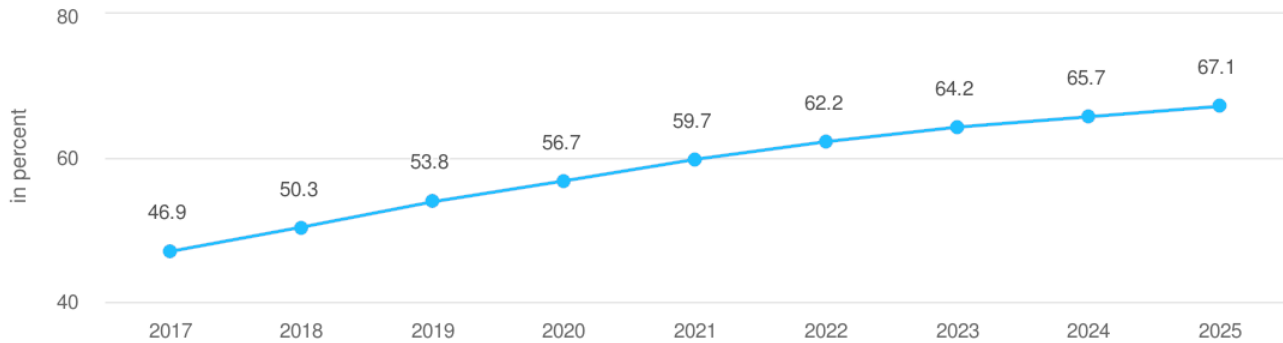
Figure 4
Source: Statista, 2021

eCommerce - Average Revenue per User by Segment
EUR (€) (Europe)
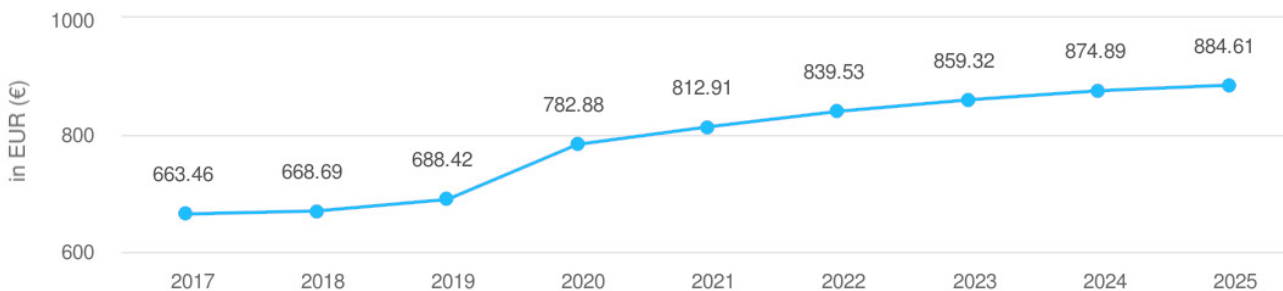
Figure 5
Source: Statista, 2021

Ecommerce sales in Italy in 2021 - 2024

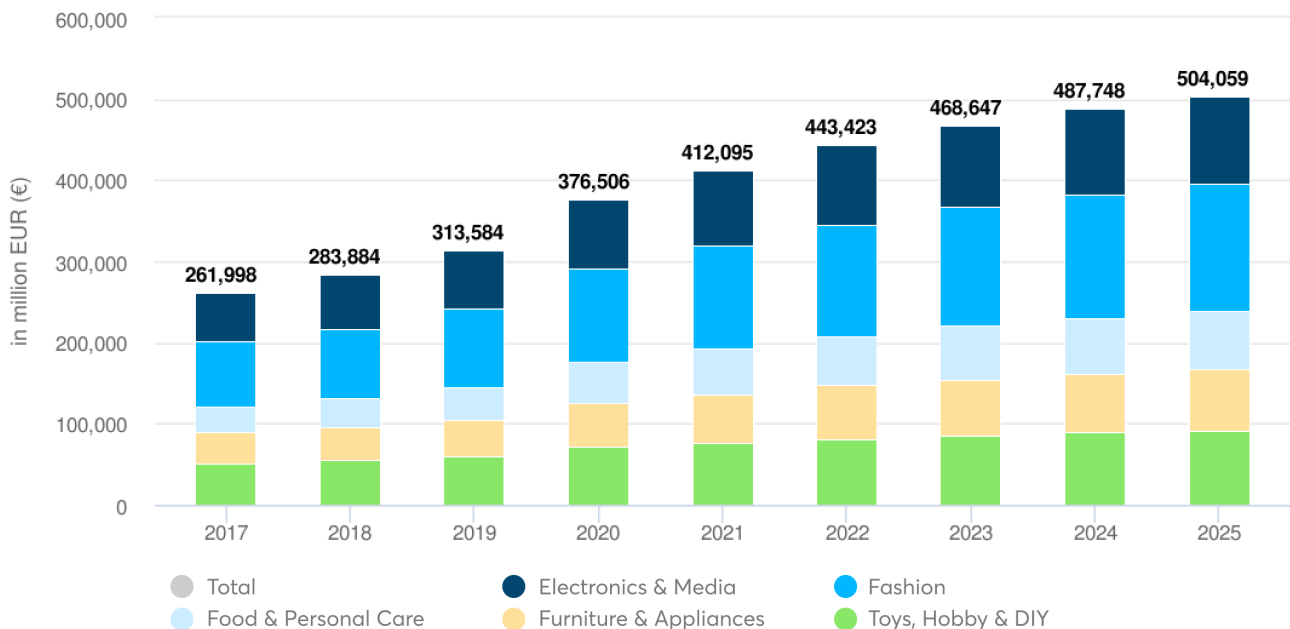In Italy, according to Statista's 'Digital market Outlook' report, Ecommerce in the next five years will grow to more than **€25 billion in 2025.**

The segment with the largest volumes is still **fashion** (Figure 6), with **€5.7 billion in revenues in 2021,** which will exceed **€7 billion in 2025.** Considerable numbers also for the **electronics** segment, which will close **2021 at around €5.6 billion** and reach

€6.8 billion in 2025. The **furniture and appliances** category, along with **food and personal care products,** will compete for third place in this ranking, standing at around **€3 billion in 2021** and growing by around €1 billion by the end of the five-year period. The leisure category such as **toys, hobby and DIY** will end **2021 at around €3 billion,** but compared to the other segments it will grow less, ending **2025 just under €3.5 billion.**
The trend in **ARPU** is interesting and less predictable: **it will see a slight drop in 2023** and then resume a linear upward trend compared to

eCommerce - Revenue by Segment
million EUR (€) (Italy)
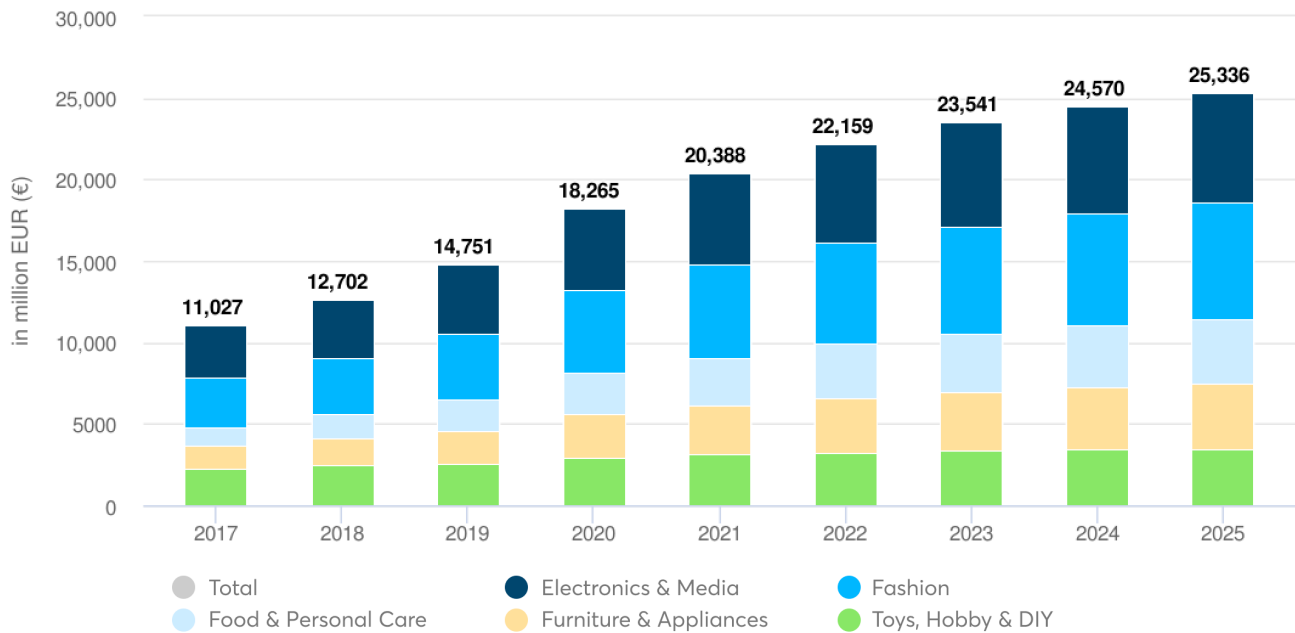
Figure 6
Source: Digital Market Outlook, Statista

the growth before 2020, which saw a significant acceleration in that year, linked to the effects of the pandemic that is still affecting sales in many online sectors.

It is also interesting to observe the share and forecast of Ecommerce purchases that have been and will be completed in shops outside the country[1].

From 2017, the beginning of the analysis period until 2025, the **weights between domestic and cross-border purchases will remain almost unchanged: 92% domestic market, 8% other countries**. How will the market be segmented in terms of payment tools? Figure 8 shows that **2020** saw an acceleration in the adoption of digital wallets, mainly at the expense of **credit cards**, which remain

eCommerce - Average Revenue per User by Segment
EUR (€) (Italy)
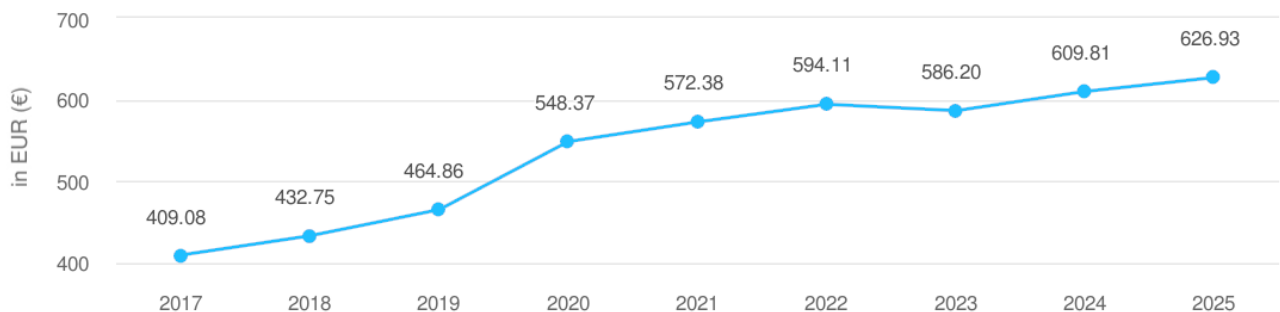
Figure 7
Source: Statista

1 - The figures are based on ecommercedb.com's analysis of the 2018 and 2019 revenue and traffic data of 10,000 individual shops in 22 countries, which was then processed in the Digital Market Outlook to 2023. A cross-border purchase occurs when a local buys from a national shop from another country.
The store is considered national if more than 50% of its revenue is generated in its main country. If no main country can be attributed to the shop (local revenues are less than 50% of the total), the revenues are divided in the calculation and the share of each country is considered national for this country. For example: Germany is the largest country for hm.com with only 17% of its revenues generated in Germany. This Ecommerce cannot be considered as German and therefore 83% cannot be considered as cross-border, but the shares will be considered as national.

the preferred method of Italians (**42% of the total tools** under analysis). According to Statista's forecasts, **2024** could be the year when **e-wallets** will be the most widely used payment instruments, gaining a **35% market share** (25% in 2021), compared to 27% for credit cards (42% in 2021).

Despite the advent of so-called alternative payments, payment cards remain among the most widely used instruments, not only in Italy. It is therefore crucial that the payment process with these tools be as frictionless as possible to ensure the best user experience for buyers and, at the same time, optimise conversions. What role has PSD2 played and is playing in payment processes and what impact are all the actors involved in the new European legislation having?

eCommerce - Revenue Share Payment Types
percent (Italy)
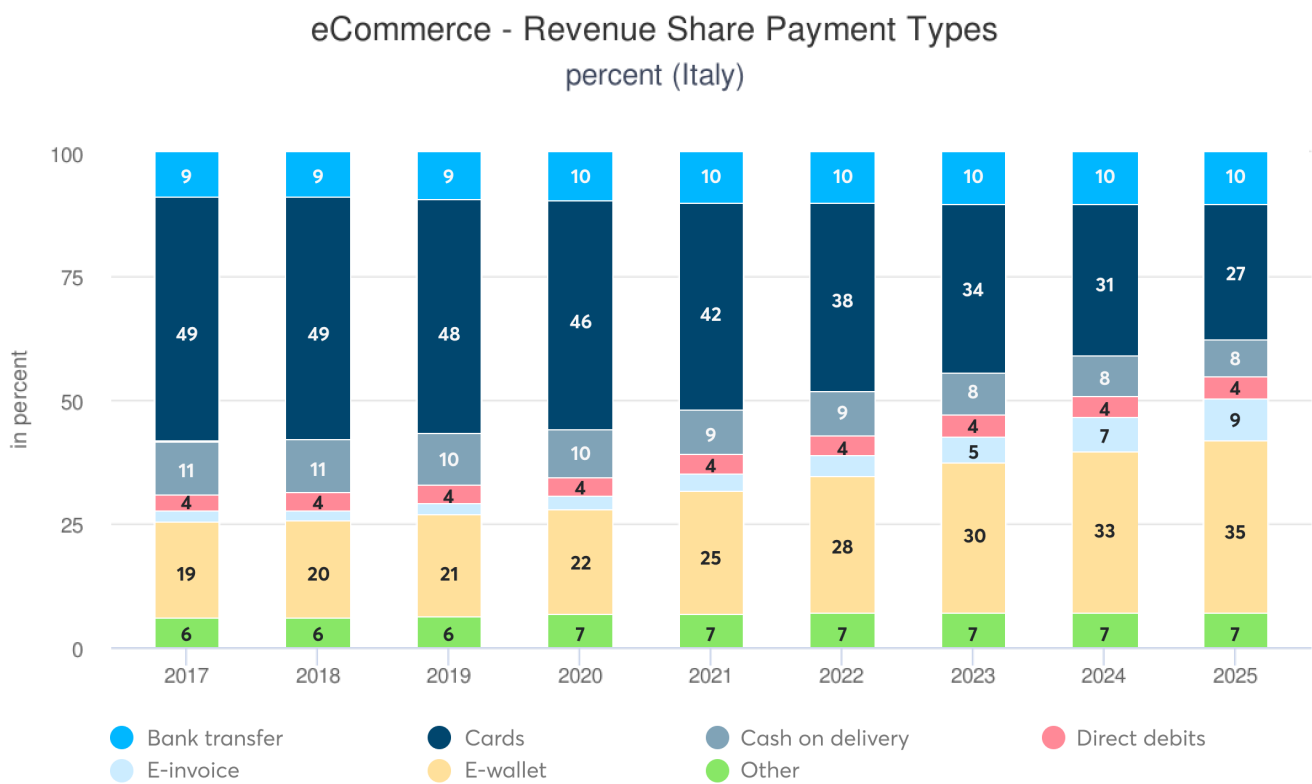
Figure 8
Source: dbcommerce.com, Statista

SCA adoption plans in Europe

Although PSD2 is an EU-wide regulation, the European Central Bank has allowed national banks in individual countries to intervene in their plans to adopt Strong Customer Authentication.

As shown in Table 5, **each country has adopted a different schedule for applying SCA** to transactions. What all countries have in common, however, is the criterion based on amounts.

In this paper, we focus on Italy which, today, has a plan to adopt the SCA for transactions:

- Greater than €1,000 starting 1 January 2021
- Greater than €500 starting 1 February 2021
- Greater than €100 starting 1 March 2021
- All from 12[2] April 2021

In Italy as well as abroad, dates may have changed depending on the performance of the entire online payment ecosystem, in the interest of all stakeholders involved.

2 - Initially, the deadline was set for 1 April but, close to that date, the Bank of Italy granted a further 12-day extension.
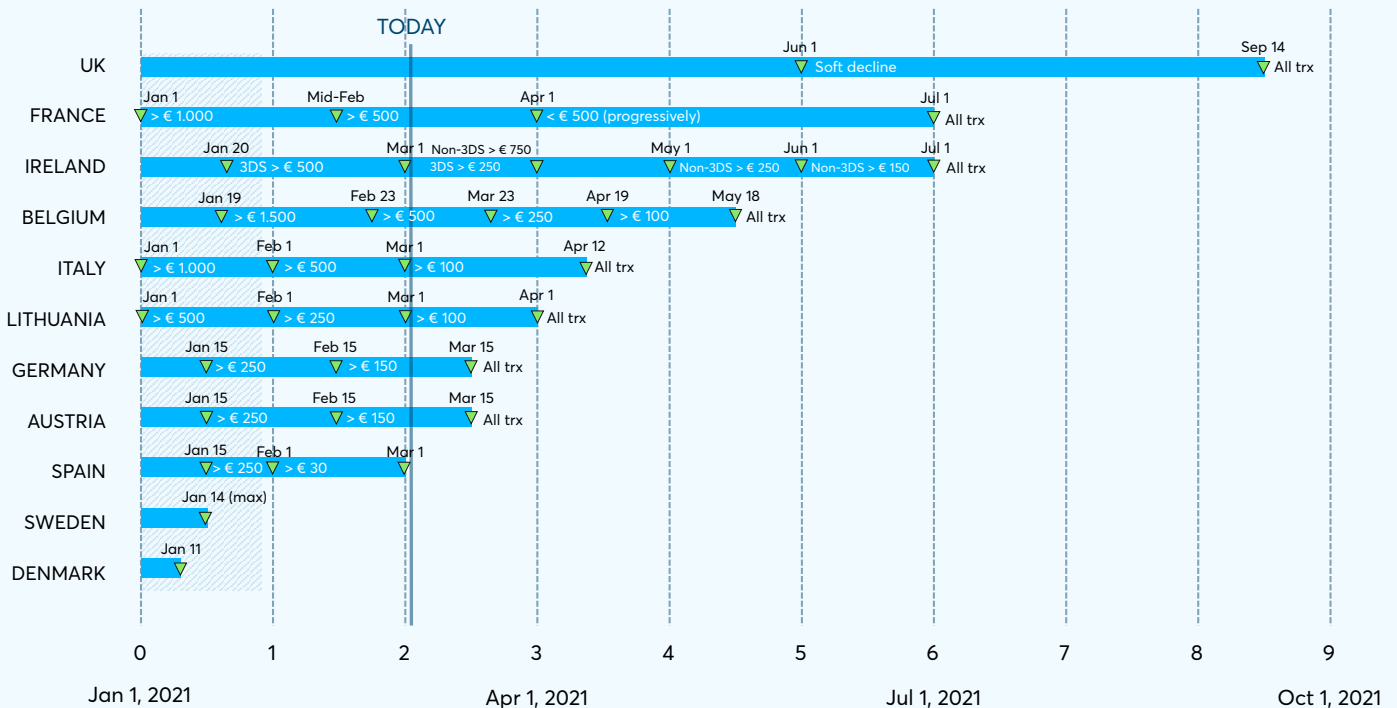
Table 5
Source: Mastercard Analysis

EEA-UK transactions and Brexit

The implementation of Brexit, which was ratified last 24 December with the signing by the European Union and the United Kingdom of a trade and cooperation agreement that entered into force provisionally on 1 January 2021, at the end of the transition period, has also created a new scenario in the area of payments. As of **this year, Great Britain and Northern Ireland are no longer subject to ECB directives** but to those of the FCA (Financial Conduct Authority), which also regulates payment services and electronic money in the UK.

As can be seen in Figure 9, the UK has decided to adopt Strong Customer Authentication starting 14 September 2021, but with the possibility of applying soft declines, i.e. refusals on authorization due to lack of authentication, starting 1 June 2021.

So, before and after 14 September 2021, what actually changes for the UK and Italy? Before 14 September, Italian issuers can apply SCA to transactions from UK acquirers depending on the latter's authentication features (with or without

3DS2), while UK issuers can authorize transactions of Italian acquirers, according to the adoption schedule shown in the chart.

From the kick-off date of 14 September, Italian issuers will have to apply SCA to payments from UK acquirers, net of possible exemptions and exceptions. It is worth remembering that PSD2 requires 2-factor authentication for one-leg transactions, i.e. payments where only the issuer or acquirer is in the European Union.

UK payment card companies, in turn, will also have to apply SCA to transactions from acquirers in the European Economic Area (EEA), again taking into account possible exemptions and exceptions.

	Today	Jun 1 2021	Sep 14 2021
UK		▼ Soft decline	▼ All trx

Figure 9
Source: Mastercard Analysis

3DS2 adoption statistics in Europe in Q1 2021

Almost four months after the implementation of PSD2 for payments, it is possible to get a picture of the impact that two-factor authentication, also known as Strong Customer Authentication, has had on online sales.

According to **Mastercard's research** on cards divided by nationality of issue and looking at the first quarter of 2021 and the first days immediately following the end of the ACH adoption period in Italy (12 April 2021), **all European countries** are experiencing a **transaction authentication rate of more than 50 per cent**.

As is evident from Table 1, the **trend of successful authentications** in the first quarter, after an initial settling phase, has been **increasing** for all the countries examined, but some continue to have an authentication rate below the European average of 74.5%. The **worst performing countries** in April were: France (66.9%), Poland (66.8%) Italy (60.2%) and Belgium (56.1%) at the bottom of the ranking, several percentage points behind.
The **UK**, included in the study despite its withdrawal from the European Union, is the **best performing nation** overall (89.4%), as shown in the table. Frictionless authentication, i.e. authentication without two-factor buyer authentication, also performed best in the UK at 61.4%.

The flow of frictionless authentication also saw a gradual improvement for almost all the countries involved in the analysis. The **European average rate** stood at **29.6%** and, as can be seen from Table 2, the dispersion is much higher than the overall authentications shown in the table above.
The high heterogeneity of frictionless authentications is the snapshot of a situation that

	% Authenticated	Overlall Authentication Rate
Grand Total	74,5%	29,6%
UNITED KINGDOM	89,5%	61,4%
CZECH REPUBLIC	86,7%	36,8%
SWEDEN	79,1%	25,2%
NETHERLANDS	76,3%	29,3%
GREECE	75,6%	43,7%
DENMARK	75,2%	1,6%
SPAIN	75,0%	38,6%
ROMANIA	72,3%	9,3%
GERMANY	71,9%	39,5%
AUSTRIA	70,1%	25,6%
HUNGARY	69,1%	7,2%
FRANCE	66,9%	9,2%
POLAND	66,8%	13,5%
ITALY	60,2%	12,7%
BELGIUM	56,1%	2,7%

Table 1
Source: Mastercard Analysis

is still in the adaptation phase, especially for some countries, among which Italy is certainly one. Naturally, difficulties in managing authentication without an ACH also contribute to the reduction in conversion, so it is essential that, on the issuing side in particular, there are short-term measures to quickly improve authentication rates.

3DS2 in Italy: lowest ranked in Europe

As shown previously, **Italy was among the least effective in Europe**, which instead recorded higher average authentication rates. The overall figure for **authentications in Italy** actually **grew**, reaching 60.2% in the first weeks of April (Table 1), but remains more than 14 percentage points below the European average.

In Italy, it is the performance of **frictionless authentication**, which has grown mainly thanks to the ability of 7 issuers to leverage exemptions, that is the least satisfactory: **12.7% against an average of 29.6%**. This is particularly significant when considering the results from countries such as **Spain**, which despite being one of the last to adopt Flow 2.0, had **38.6% of successful frictionless authentications** in April.

These figures not only give the picture of the Italian market in terms of application of SCA, but also explain why **Italy, at the beginning of March, was losing about 58% of its 3DS transactions**. When the **Access Control Server (ACS)**, i.e. the entity that verifies whether the card adheres to the protocol and manages the authentication of the card at the payment stage, is **unable to provide an outcome to a payment made with a card with active 3DS2 protocols** due to technical problems. This is called an **Attempt**. **Italy is above the European average** in this respect: 4.5% against 3.1% (Table 3).

Although this figure has improved in line with the European average since January - Attempts were reduced in both cases by 61% between January

and the first 12 days of April - **Italy** continues to lag behind and to rank **among the least performing countries**.

	% of Trx authenticated frictionless
Grand Total	29,6%
UNITED KINGDOM	61,4%
CZECH REPUBLIC	36,8%
GREECE	43,7%
GERMANY	39,5%
SPAIN	38,6%
NETHERLANDS	29,3%
AUSTRIA	25,6%
SWEDEN	25,2%
POLAND	13,5%
ITALY	12,7%
ROMANIA	9,3%
FRANCE	9,2%
HUNGARY	7,2%
BELGIUM	2,7%
DENMARK	1,6%

Table 2
Source: Mastercard Analysis

Even if the Italian figures are not among the worst, it is important to remember that, while it is true that in these cases the transaction goes directly to authorisation, the issuer often responds with a 'KO' so as not to incur fraud costs in the event that the payment is not genuine.
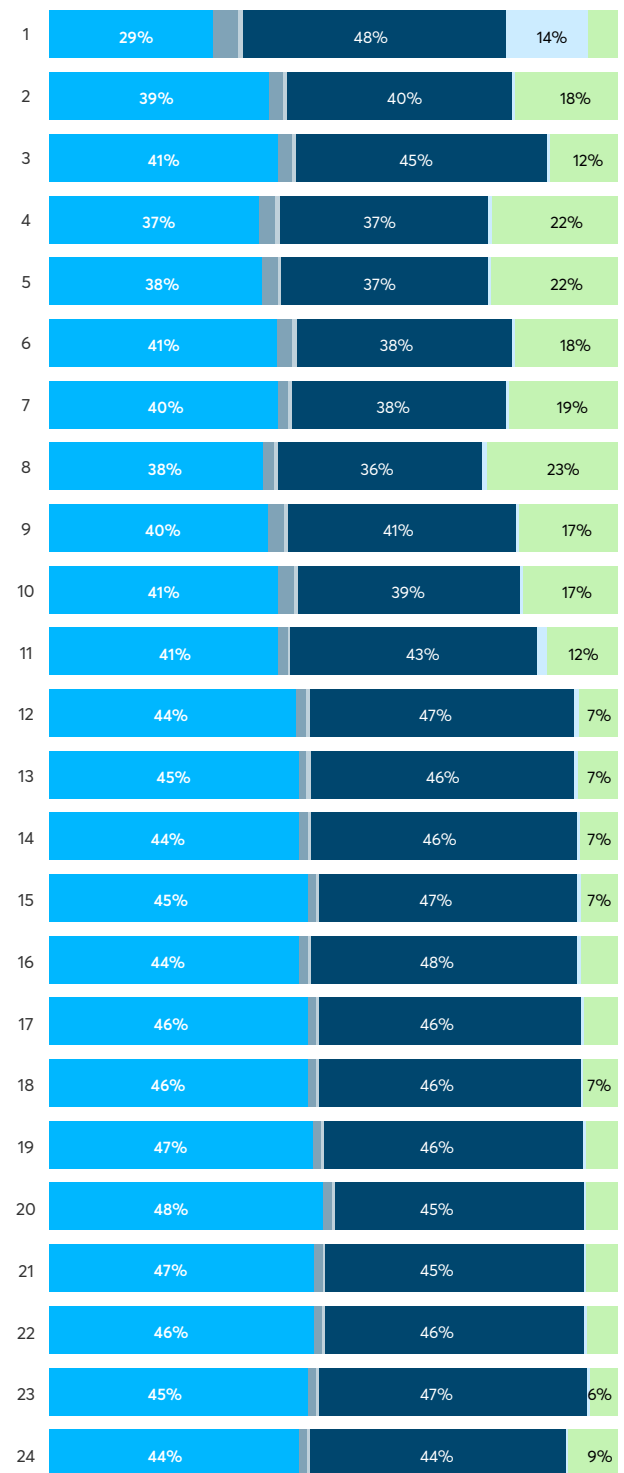
While this may appear to be a ploy to avoid SCA, in reality, **a high number of Attempts** again results in a **drop in conversion of the cart**.

Overview of authentications in Italy: comparison of January with Q1 2021

The **rate of transactions for which authentication failed** was around **46% in March**, which is still very high, especially when compared to the system average. The graph in Table 4 shows the daily results of authentications in January which, when compared with the data for March, provide a picture of the trend over time.

First of all, it is clear that the number of **authentications not completed due to ACS technical problems has been gradually decreasing** to approximately 7%. It should be remembered, however, that although these transactions are sent directly to authorization and therefore pass the 'barrier' of 2-factor authentication, **a large proportion are rejected by the issuer**, so it is plausible that these outcomes will reduce further over time until they approach a value of zero.

What should also be taken into account is that the **growth trend in Authenticated**, after initially weak growth, **stopped at around 46%** towards the end of March (42.3%, average for January). **Not authenticated** transactions followed the same trend, sharing the space freed up by Attempts with authenticated transactions, reaching values of around 46% at the end of the period (46.2%, average for January).

Day	Y - Authenticated	N - Not Authenticated	C - Challenge	A - Attempts
1	29%	48%	14%	
2	39%	40%		18%
3	41%	45%		12%
4	37%	37%		22%
5	38%	37%		22%
6	41%	38%		18%
7	40%	38%		19%
8	38%	36%		23%
9	40%	41%		17%
10	41%	39%		17%
11	41%	43%		12%
12	44%	47%		7%
13	45%	46%		7%
14	44%	46%		7%
15	45%	47%		7%
16	44%	48%		
17	46%	46%		
18	46%	46%		7%
19	47%	46%		
20	48%	45%		
21	47%	45%		
22	46%	46%		
23	45%	47%		6%
24	44%	44%		9%

Status DS to 3DS   Period: 01 to 24 Jan 2021

- ■ Y - Authenticated
- ■ U - Unavailable
- ■ Undefined
- ■ N - Not Authenticated
- ■ C - Challenge
- ■ A - Attempts

Table 4
Source: Mastercard Analysis

Although they occur infrequently, **Challenged, Unavailable** and **Undefined** transactions **point to technical errors and system anomalies** that fortunately account for only one or two percent of the total and, as with Challenged transactions, the whole ecosystem is working to eliminate them completely.

3DS flows in Italy: overview of the evolution of transactions between January and April

The evolution of authorisation flows in the period from 1 January to 14 April shows that the number of daily transactions to which the 3DS 2.0 protocol was applied has risen steadily since the beginning of the year (Figure 9). However, the speed of growth was not constant: while in **February growth was 9%** compared to January, **in March** the increase compared to the same month was **37%**.

The **end of the ramp-up** period saw the number of calls on the 3DS 2.0 protocol soar, in fact more than doubling the daily transactions from the beginning of the year and **up 48% on 13-14 April** compared to March figures.
Mastercard's analysis then compared authorisation flows without security protocols with those to which 3DS was applied, in versions 1.0 and 2.0 (Figure 9). The graph shows **a steady decrease in flows without protocols** in favour of those with protocol 2.0, while authorisations with version 1.0 have remained constant over time.

In the first two weeks of April **3DS streams** reached almost **17% of the total** and of these 3DS **2.0 accounted for around 51%**, growing almost twice as fast as in January, when 3DS 2.0 streams were around 27% of the total.

The adoption of 2.0 protocols was accompanied by a gradual increase in the authorisation rate and a more or less stable percentage of daily transactions lost, with the exception of March, which saw a 7% increase over January.

3DS 2.0 Flow Italy Transactions Evolution - Average daily trx (index number)
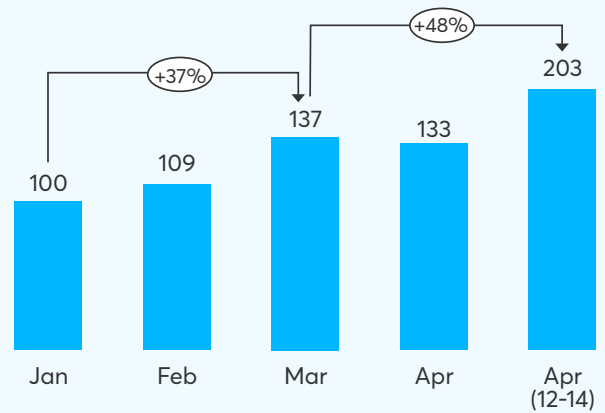
3DS 2.0 Flow Italy Transactions Evolution - Authorization Flow (% of trx)
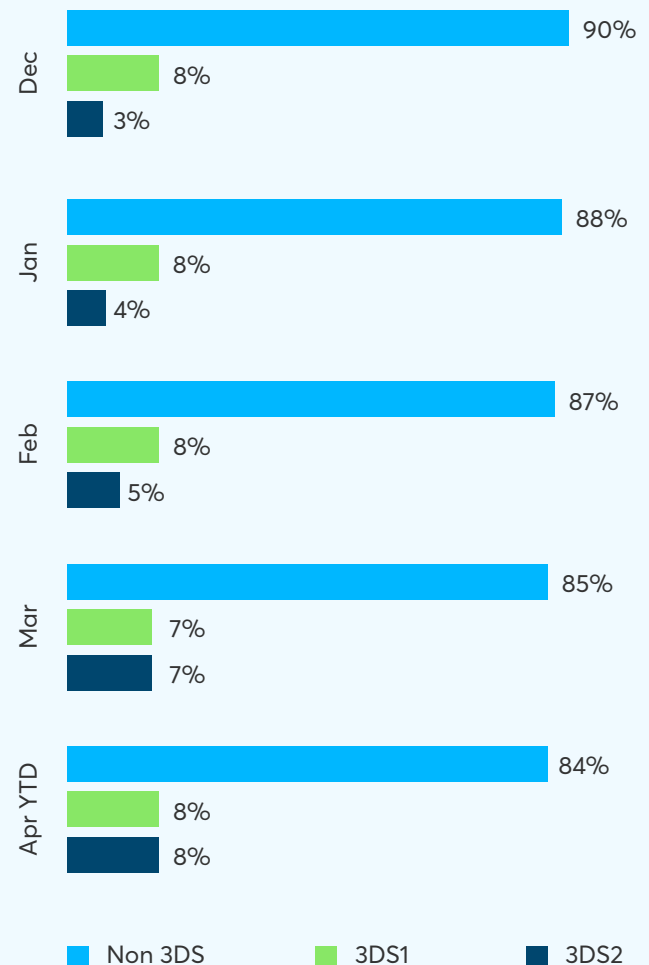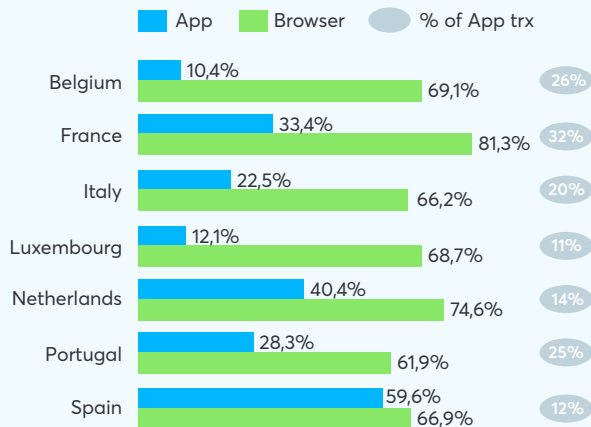

Figure 9
Source: Mastercard Analysis

Figure 10
Source: Mastercard Analysis

3DS Flow - WE / App vs browser flow
WE ACS Authentication rates (%) (by iss ctry, 22-28 Mar)

App   Browser   % of App trx

Country	App	Browser	% of App trx
Belgium	10,4%	69,1%	26%
France	33,4%	81,3%	32%
Italy	22,5%	66,2%	20%
Luxembourg	12,1%	68,7%	11%
Netherlands	40,4%	74,6%	14%
Portugal	28,3%	61,9%	25%
Spain	59,6% / 66,9%		12%

ACS authentication rate is defined as 1. authentications succesfully validated by the ACS divided by 2. the total authentication sent to the ACS

The comparison of Italian authentications, via browser and app, with the rest of Western Europe, again relegates Italy to among the lowest ranked. Only Belgium and Luxembourg do worse in app authentication which, in Italy, accounts for 20% of the total number of authentications.
The reasons for this are mainly found in the development of non-optimised provider SDKs and issuer apps that do not always perform perfectly, so these are where efforts should be concentrated. Mastercard, in order to help improve this data, is working on a platform for testing app-based authentication that will be announced soon.

3DS Flow - Lost transactions

— Authentication rate
■ Daily Lost Trx (index number)

	Jan	Feb	Mar	Apr	Apr (12-14)
Authentication rate	42,3%	47,8%	54,8%	60,2%	59,9%
Daily Lost Trx	100	99	107	92	141

7%   31%

Figure 10
Source: Mastercard Analysis

The end of the ramp-up period, however, caused both figures to deteriorate rapidly. While the **authentication rate rose from 42.3% in January to 60.2% at the beginning of April** (Figure 10), **it fell to 59.9%** between **12 and 14 April**. **Lost transactions** were also negatively affected, going from an **8% improvement over January** to a **41% deterioration over the same month.**

The reasons for failed authentications in Italy

Why do authentications fail? According to Mastercard's analysis of Transaction Reason Codes, there are three macro-categories:

ACS timeout

More than 50% of failed authentications can be traced back to the communication process with the ACS. Possible difficulties in handling response messages from or to the ACS may be causing timeouts.

Card without 3DS2 protocols or Transaction not allowed

Approximately 30% of authentications fail **because the card may have active 3DS2 protocols** or the **authentication request is not allowed** because the cardholder has not provided all the data required for the issuer to complete the authentication (e.g. no phone number to send the OTP to in order to finalise the transaction).

Abandonment of authentication

In this case, **the buyer has not completed authentication because they have abandoned** the transaction. This reason concerns 16.3% of the total and is mainly due to the user experience offered by everyone involved in authentication and especially by the issuer that manages the process, including in terms of front-end.

Approximately 3% of the remaining failed authentications are due to a very fragmented set of reasons and, therefore, not very relevant for
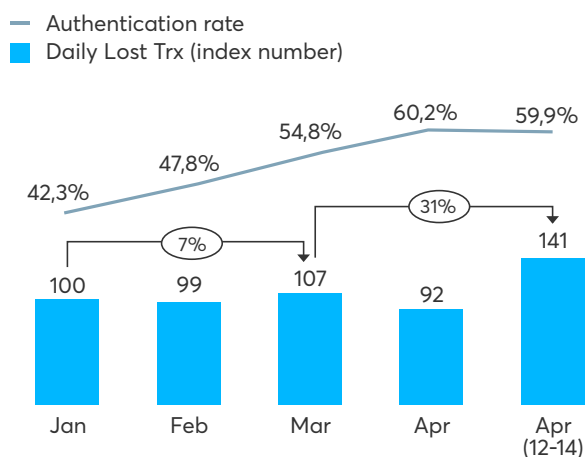
statistical purposes. Authentication requests not sent by merchants are decreasing - from 66 per cent in January to 61 per cent in April - but causes related to the user experience offered by issuers are decreasing very slowly at the expense of shopping cart conversions, which negatively impact sales and shopper retention.

Strong Customer Authentication: Axerve observation data

Axerve's calculations, covering the period from 1 March to 17 April 2021, **allow us to compare the conversion trend on authentications** with what was observed globally by Mastercard.

With respect to circuit data, in fact, it is important to underline that each payment service provider may adopt different technical solutions compared to its competitors, which may result in technical errors depending on one or the other party involved in the process.

From a methodological point of view, the **3D Secure 2 authentication attempts were observed in two phases**: firstly, **the type of action required in the face of the authentication attempt** was analysed; secondly, **the result of the challenges requested by the issuers**, i.e. the actual two-factor authentications, was detailed.

Figure 11 compares March data on call outcomes with 3DS2 protocols, challenge results and reasons for failed authentications.
The graphs show that **successful challenges exceeded 70%** and that the **conversion on authentication** (not to be confused with the conversion in the authorisation phase) recorded an **overall value of 74.59%**.

The graph relating to **the reasons for the failed authentications** (Figure 11) shows that about **59% were due to technical errors** (ACS timed out) or **problems with enrolment of the card on the protocol**, while **21% of the KOs** were linked to the **failure of authentication by the merchant** (authentication failed).

The undefined reasons are almost entirely made up of errors for which no specific reason was received

```
                    3DS2 transactions

    Challenge        Frictionless        Attempt            KO

  OK        KO
```
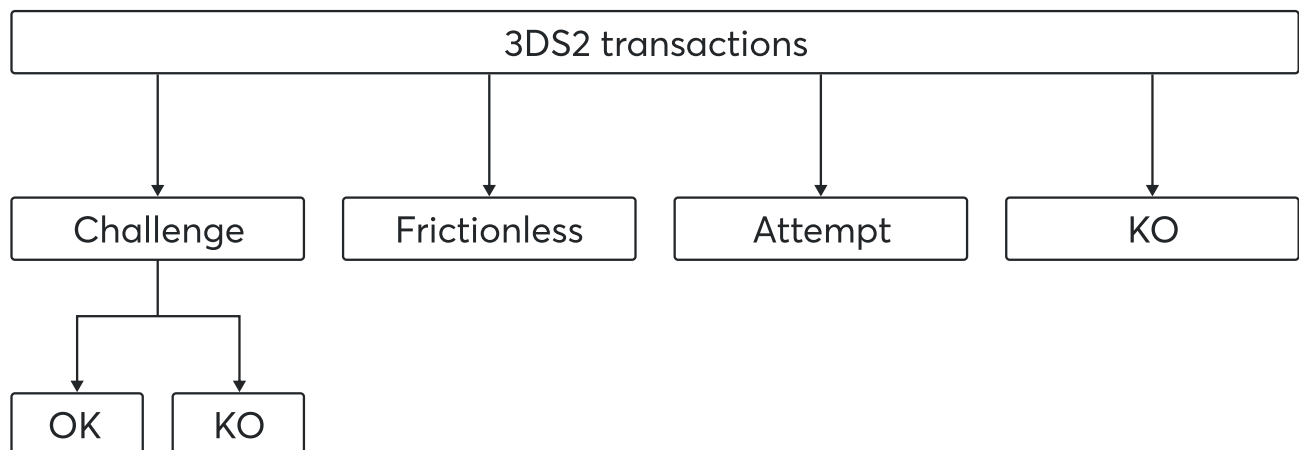
(reason = null) and are therefore the subject of further investigation with the individual issuers.

The data for April (Figure 12) of course still offers a partial view and it will be particularly interesting to compare it with the previous months once the period is over. The values shown, however, already give a picture of current trends, such as the **increase in frictionless authentication**, a sign that the whole system, issuers in particular, is increasingly leveraging exemptions.

As highlighted in Mastercard's analysis, it will be crucial to optimise the management of exemptions in April and in the coming months to ensure that the end of the ramp-up period, which ended on 12 April, does not further affect performance and lead to cart losses.

In this sense, it is reassuring to note that, in relative terms, the **suspension of the ramp-up period did not have a major impact on the system performance** of the traffic processed by Axerve (Table 6). The impact of this event, however, although invisible in the observation of percentage data, becomes tangible for those merchants whose transactions of amounts less than € 100, which until 12 April were therefore exempt, are now subject to

Figure 11
Source: Axerve Analysis

March - Challenge result

- Challenge OK: 71,45%
- Challenge KO: 28,55%
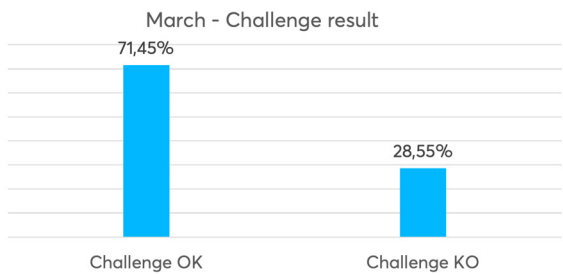
Figure 12
Source: Axerve Analysis

April - Challenge result

- Challenge OK: 72,53%
- Challenge KO: 27,47%

March - Decline reasons

- Undefined: 19,06%
- ACS timed out: 35,23%
- Risk declines: 0,15%
- Enrollment issues: 23,87%
- Abandonment: 21,70%

April - Decline reasons

- Undefined: 11,77%
- ACS timed out: 39,23%
- Risk declines: 0,08%
- Enrollment issues: 24,25%
- Abandonment: 24,68%

March - 3DS2 response

- % Challenge: 78,97%
- % Frictionless: 14,29%
- % Attempt: 3,88%
- % KO: 2,87%

April - 3DS2 response

- % Challenge: 76,84%
- % Frictionless: 16,61%
- % Attempt: 3,87%
- % KO: 2,68%

Date	% challenge	% Frictionless	% Attempt	% KO	Challenge OK	Challenge KO	Abandonment	Enrollment issues	Risk declines	ACS timed out	Undefined
01/04/21	76,21%	16,06%	4,87%	2,86%	71,56%	28,44%	21,98%	22,09%	0,28%	41,78%	13,87%
02/04/21	75,89%	17,27%	4,02%	2,82%	71,90%	28,10%	22,34%	21,44%	0,14%	43,83%	12,26%
03/04/21	76,52%	17,83%	3,24%	2,42%	73,34%	26,66%	26,85%	21,44%	0,04%	41,55%	10,12%
04/04/21	75,57%	18,07%	3,87%	2,50%	73,66%	26,34%	25,06%	21,17%	0,07%	43,02%	10,68%
05/04/21	76,45%	17,58%	3,47%	2,49%	74,51%	25,49%	26,07%	22,64%	0,10%	41,57%	9,62%
06/04/21	76,55%	17,04%	3,60%	2,81%	72,34%	27,66%	24,98%	24,93%	0,07%	36,98%	13,04%
07/04/21	77,09%	16,66%	3,50%	2,75%	70,52%	29,48%	27,84%	23,30%	0,08%	37,69%	11,09%
08/04/21	75,67%	16,79%	4,64%	2,90%	71,55%	28,45%	26,96%	23,77%	0,06%	37,04%	12,18%
09/04/21	76,60%	17,53%	3,13%	2,75%	73,48%	26,52%	24,24%	24,73%	0,06%	40,69%	10,29%
10/04/21	76,99%	17,26%	3,08%	2,67%	74,05%	25,95%	25,79%	22,35%	0,08%	42,80%	8,97%
11/04/21	76,41%	17,71%	3,45%	2,42%	74,62%	25,38%	24,24%	23,39%	0,15%	42,54%	9,67%
12/04/21	73,57%	15,41%	7,69%	3,33%	67,06%	32,94%	23,75%	21,66%	0,04%	30,95%	23,60%
13/04/21	79,65%	14,84%	3,01%	2,50%	73,10%	26,90%	22,42%	28,74%	0,03%	38,79%	10,02%
14/04/21	78,43%	15,80%	3,24%	2,53%	72,82%	27,18%	22,69%	27,43%	0,03%	38,39%	11,46%
15/04/21	78,88%	15,60%	2,99%	2,52%	73,86%	26,14%	25,38%	27,86%	0,03%	39,21%	7,52%
16/04/21	78,06%	16,46%	3,10%	2,37%	74,18%	25,82%	25,00%	27,70%	0,03%	39,86%	7,41%
17/04/21	77,71%	17,25%	2,81%	2,24%	75,03%	24,97%	25,96%	24,27%	0,05%	42,85%	6,87%
Total	76,84%	16,61%	3,87%	2,68%	72,53%	27,47%	24,68%	24,25%	0,08%	39,23%	11,77%

Table 6
Source: Axerve Analysis

the PSD2 regulation, consequently suffering the friction resulting from the application of the 3DS2 protocols.

In conclusion, we observe a **conversion rate during authentication that is slightly higher than the average recorded by Mastercard** and consistent with the trends recorded by the circuit. Specifically, although still far from the desired values, there was a significant increase in the proportion of traffic authenticated in a frictionless manner by issuers, and the percentage of **successful challenge authentications was 72.53%**, compared to just over 60% at the beginning of the year.

Standard deviations: Performance comparison for BINs in March-April

Particularly interesting in the context of understanding the mechanisms underlying the authentication performances observed is the study of their distribution across the BIN range. BIN ranges are partitions of the card pool, characterised by the commonality of the first six digits, associated with a specific issuer and allow us to observe how the characteristics of the technological tools made available for each BIN

range, or the characteristics of the type of clientele to which each BIN range is oriented, can affect the ease of completion of a 3DS2 transaction.

The analysis shows how **each BIN range**, represented by a point on the graph, **positions itself in relation to the various dimensions under analysis**: the outcome of the 3DS call and the outcome of the requested challenges. The database consists of the performance recorded in April on the 250 BIN ranges for which Axerve processed at least 500 3DS2 transactions, thus ensuring statistical significance of the sample analysed.

To accompany each graph, we indicate the standard deviation - or mean square deviation - which makes it possible to measure the dispersion of the values recorded for each BIN with respect to their mean value, identifying a greater or lesser "closeness" of the values taken into consideration with respect to the benchmark.
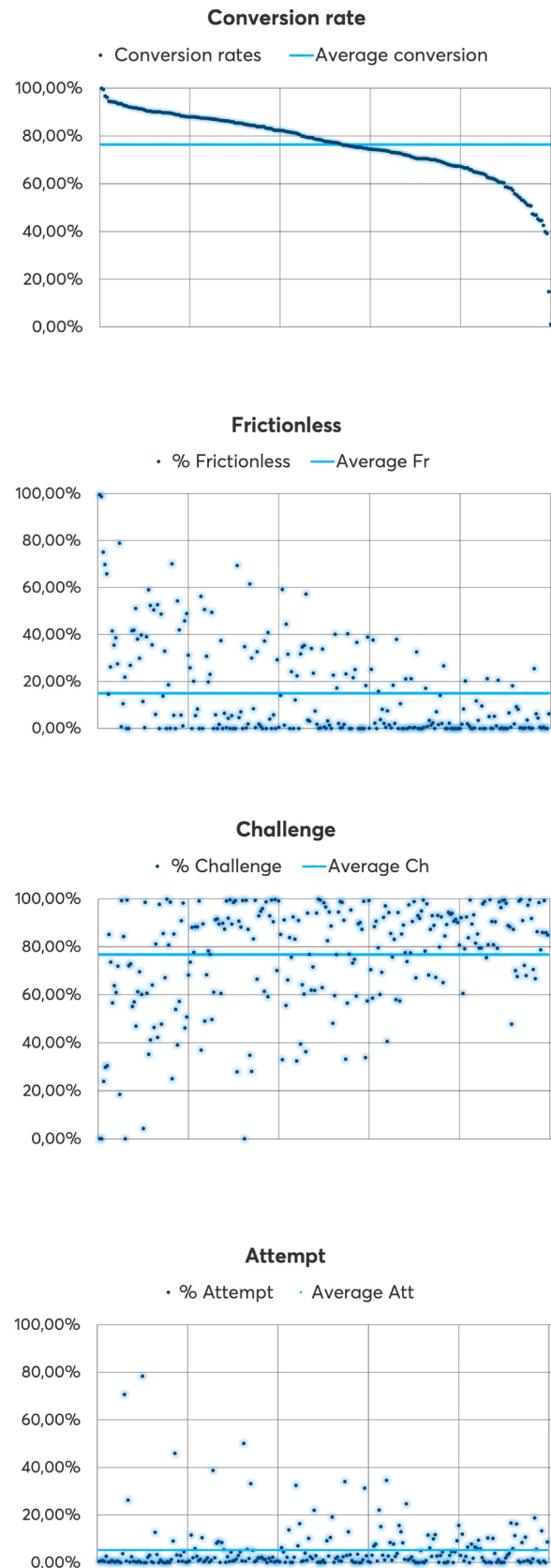
The graph that emerges, ordering the BIN ranges according to their authentication conversion, shows that the performance distribution has two very distant extremes, with a **standard deviation of 13.8%**.

On the left are those institutions that have managed to ensure a high quality of service either through effective buyer training or, more likely, by designing more user-friendly authentication solutions, while on the right are those BIN ranges of institutions that still have difficulty in providing their customers with a user-friendly tool or one that is sufficiently stable in performance.

In the following graphs, to facilitate interpretation, the order of the BIN ranges on the graph will be the same for all of them: the first BIN shown on the left in the graph is the same for all graphs.

It is clearly visible in Figure 14 that **the dispersion is quite high for all categories** of transactions, which means that **we are still in a settling phase** in which

Figure 13
Source: Axerve Analysis

Conversion rate

· Conversion rates —— Average conversion

Frictionless

· % Frictionless —— Average Fr

Challenge

· % Challenge —— Average Ch

Attempt

· % Attempt · Average Att

the answers can vary a lot, making statistically even more complex the identification of a common path for the whole ecosystem of issuers.

However, we can highlight some significant trends. Firstly, the **KO response to the 3DS** call, which is physiological to a limited extent, **is very significant on a not insignificant portion of the BIN range** that is in the right half of the distribution, characterised by lower conversion rates.

The concentration of BINs with high percentages of frictionless transactions in the left-hand half of the graph thus reinforces the **correlation between high conversion rates and strong application of exemptions by issuers**, which was also found in Mastercard's analysis.
A similar distribution of BIN ranges is present, even if with lower intensity, observing the share of transactions that received an attempt result, with the difference that this parameter, although from a conversion point of view is similar to the frictionless result, denotes the Issuer's difficulties in managing authentication.

Finally, it is particularly interesting to observe **the distribution of the BIN range in relation to the incidence of challenge requests on the total number of transactions processed** (Figure 15): in fact, although it is evident that the use of frictionless contributes significantly to increasing the conversion rate, we see that even those **institutions that have chosen to apply exemptions more conservatively**, implementing an optimised authentication mechanism, **have managed to excel in maintaining appreciable conversion rates**.

This phenomenon, which is also highlighted by the distribution of BINs according to the outcome of challenge requests (Figure 15), is particularly significant: in fact, exemptions can only be applied up to a maximum amount of €500, which in practice is most frequently limited to €250 and therefore not applicable to all types of goods and services.
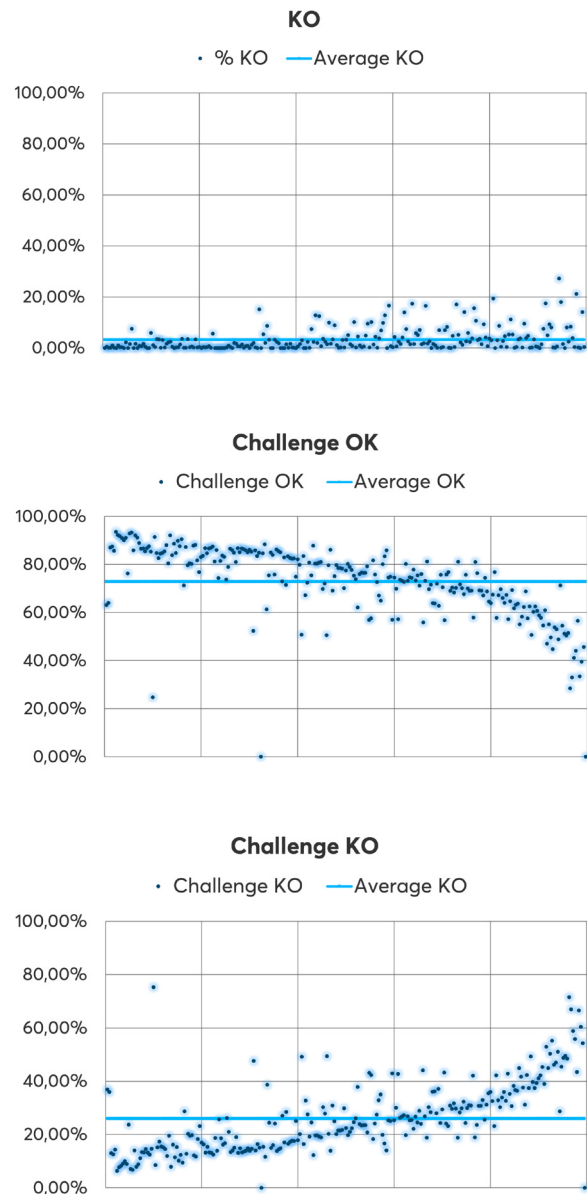
Figure 14
Source: Axerve Analysis

KO

Figure 15
Source: Axerve Analysis

How to improve conversion rates on authentications with Axerve

We have seen how, in the face of the difficulties relating to the conversion of carts described in this document, which were mainly due to the activities of all the participants involved in PSD2, many of the national banking authorities, in agreement with the ECB, granted a "ramp-up" period for the application of the protocols, which however in most cases has now been concluded.

It is therefore strategic to ensure that the impact of protocols on conversion rates is as low as possible, while maintaining high levels of security. **So what are the opportunities to seize in order not to lose sales and customers?** We can identify two fronts on which to intervene:

- **optimisation of the user experience** at the authentication stage, by the issuer
- **leverage exemptions** under PSD2 legislation

The most effective tool available to merchants is transaction risk analysis (TRA), which allows them to maintain a high level of payment security while reducing possible barriers at the payment stage.

In order to take advantage of the opportunities offered by exemptions, **Axerve has integrated a solution that aims to improve conversion rates through in-house** transaction risk analysis.

The Axerve Advice technical solution

The 3DS2 exemption solution developed by Axerve offers merchants **the possibility to process transactions directly in authorization**, shifting liability to the merchant. By also **integrating the Axerve Guaranteed Payment fraud prevention service, any fraud would be borne 100% by Axerve**.

The TRA (Transaction Risk Analysis) consists of a real-time assessment of the transaction risk and allows for the possible exemption of transactions below €500 from the SCA. Transactions with low levels of fraud risk can be processed without authentication: by sending them with an exemption request, the probability that they will be authorised increases, but the responsibility for any fraud remains with the merchant.

Axerve Advice (TRA)

Axerve Advice performs a real time risk analysis, allowing for a **TRA exemption** to be requested whenever it is possible.
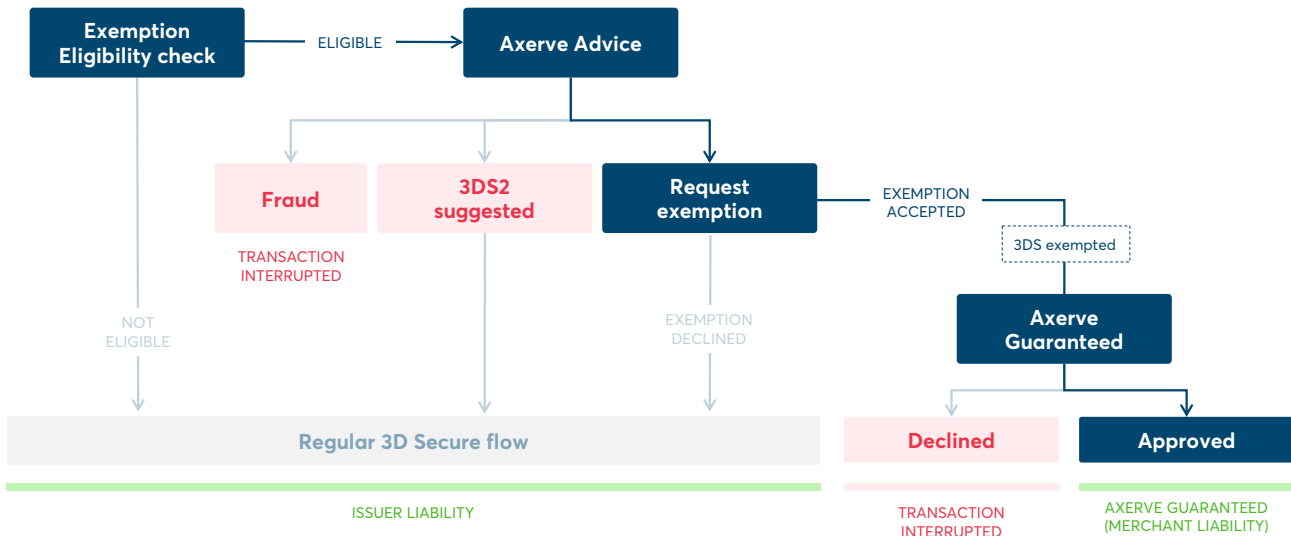
Authentication

Authorization

Axerve Guaranteed

After the authorization, a second fraud check is performed with Axerve Guaranteed Payments in order **to lift any fraud-related risk** from you.

Workflow overview


```
Exemption
Eligibility check  ──ELIGIBLE──▶  Axerve Advice

                    Fraud      3DS2        Request          EXEMPTION
                              suggested    exemption        ACCEPTED
                                                                        ┌─────────────┐
                 TRANSACTION                                            │ 3DS exempted │
                 INTERRUPTED                                            └─────────────┘

  NOT                                    EXEMPTION                      Axerve
ELIGIBLE                                 DECLINED                       Guaranteed

        Regular 3D Secure flow                              Declined         Approved

              ISSUER LIABILITY                           TRANSACTION    AXERVE GUARANTEED
                                                         INTERRUPTED    (MERCHANT LIABILITY)
```

Thanks to Axerve's solution, **processed transactions are checked** and, if passed, **sent directly to the authorizer**, avoiding 2-factor authentication.

In the event of a **soft decline**, i.e. a KO by the issuer on a transaction sent under exemption, the service is also **able to repeat the authorisation request**, effectively automating a part of the process that would otherwise require manual intervention.

Ultimately, the Axerve Advice solution aims to intervene in risk analysis, improving its effectiveness and contributing to an increase in the potential number of transactions finalised without the aid of 3DS protocols which, by their very nature, can affect conversions, as explained in previous sections. **For more in-depth technical specifications and to activate the Axerve Advice solution, please contact your sales representative**.

axerve

www.axerve.com