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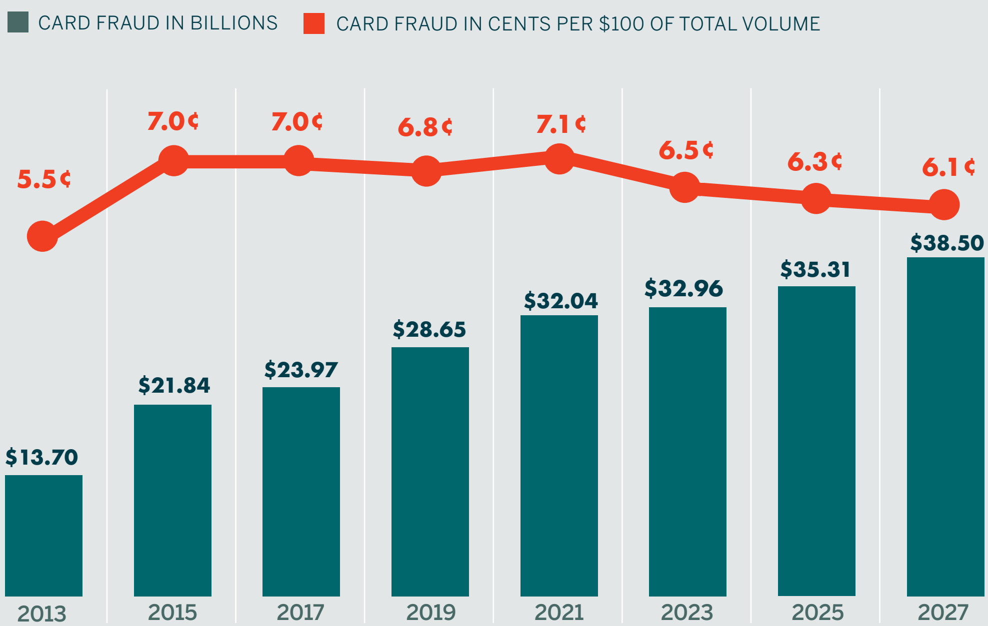
NILSON REPORT

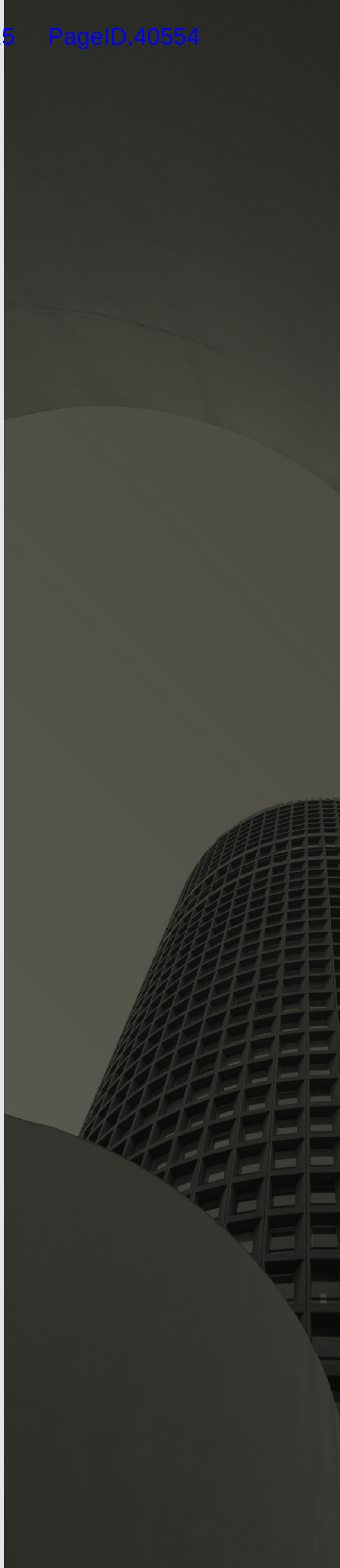
ARTICLES IN THIS ISSUE

Card Fraud Worldwide

Card-based payment systems worldwide generated gross fraud losses of $28.65 billion in 2019, amounting to 6.8¢ for every $100 of total volume.

Read full article on page 4





CONTENTS

FEATURED IN OUR UPCOMING ISSUE

Consumer Payment Systems in the U.S.

In our annual report we break down personal consumption expenditures into all card-based (credit, debit, prepaid, EBT), paper-based (cash, checks, money orders, official checks) and digital-based (preauthorized and remote) payment instruments for calendar year 2019. We also provide a 5-year projection.

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First Look

News in brief on payment industry trends around the world.

FISERV enables payments at ExxonMobil locations from consumers who use the Google Pay app, either by scanning a QR code on the pump or by activating the pump from within the Google Pay app on iOS or Android devices.

Josh Woodward is Director at Google Pay, joshwoodward@google.com, www.google.com. Nandan Sheth is Head of Global Digital Commerce at Fiserv, nandan.sheth@fiserv.com, www.fiserv.com.

XOOM, PayPal's remittance service, offers customers in the U.S. the ability to send money directly to a recipient's eligible bank account or debit card online or through Xoom's mobile app. Recipients can receive funds without needing to sign up for an account with Xoom or PayPal or fill out any forms.

Julian King is VP and General Manager at Xoom, julian.king@paypal.com, www.xoom.com.

PAYONEER'S payment orchestration platform is available to ecommerce merchants in North America that want to accept international payments. The platform serves as a technical layer that provides the merchant with a single integration connecting them to more than 100 payment providers, payment methods and risk providers.

Keren Levy is COO, kerenle@payoneer.com, www.payoneer.com.

INCOMM PAYMENTS has partnered with Mastercard to launch mastercardgiftcard.com, a website that exclusively sells Mastercard prepaid cards and distributes them by email and mail. Cards can be added to Apple Pay, Google Pay and Samsung Pay wallets.

John Levitsky is EVP Account Management at Mastercard, john_levitsky@mastercard.com, www.mastercard.com. Adam Brault is SVP of Financial Services at InComm Payments, abrault@incomm.com, www.incomm.com.

TD, Canada's largest credit card issuer, has upgraded its TD Aeroplan Visa credit card portfolio. Current TD Aeroplan Visa cardholders will automatically get access to the updated card benefits and Aeroplan program.

Katy Boshart is SVP, Canadian Credit Cards at TD, katy.boshart@td.com, www.td.com.

PAYMENT ALLIANCE INTERNATIONAL will offer Bitcoin-to-cash capabilities at over 95,000 ATMs through a partnership with B4U Financial. Authorization, clearing and settlement will be handled by B4U.

David Dove is CEO at PAI, david.dove@gopai.com, www.gopai.com. T. Jack Williams is CEO at B4U Financial, jack.williams@b4ufinancial.com, www.b4ufinancial.com.

OP FINANCIAL GROUP in Finland and TietoEvry, supplier of Visa and Mastercard cards to OP Bank as well as related personalization services, have agreed to cooperate on a biometric payment card pilot. Tag Systems and Zwipe are partners.

Jarmo Rouhiainen is Head of Card Production and Personalization at TietoEvry, jarmo.rouhiainen@tietoevry.com, www.tietoevry.com. Teemu Korte is Head of Payment Cards at OP Financial, teemu.korte@op.fi, www.op.fi.

CITI has selected Mastercard as its network partner for the Citi Plex Account on Google Pay, a digital checking and savings account to be launched in 2021. Citi Plex Account customers will receive an automatically provisioned instant digital debit Mastercard card. An optional contactless-enabled physical debit Mastercard will be available.

Alpesh Chokshi is Head of Business Development at Citi's Global Consumer Bank, alpesh.chokshi@citi.com, www.citi.com. Meredith Spatz is EVP, North America at Mastercard, meredith.spatz@mastercard.com, www.mastercard.com.

ABU DHABI ISLAMIC BANK in the United Arab Emirates has opened 15,000 NFC-enabled POS terminals to UnionPay card and contactless payment transactions.

Kutbuddin Gheewala is Head of Operations—Merchant Acquiring at ADIB, kutbuddin.gheewala@adib.ae, www.adib.ae.

XTM, a Toronto-based fintech that provides mobile banking, has launched an unsecured Visa credit card program called the Vert Card. Younger adults can use the card to establish credit. Vert Card also offers any adult the opportunity to reestablish or repair their credit. Credit limits range from $250 to $500.

Marilyn Schaffer is CEO at XTM, mschaffer@xtminc.com, www.xtminc.com.

SEON'S fraud prevention tool will be used to help identify users who attempt to open multiple accounts on Unikrn's bookmaking platform.

Tames Kadar is CEO at Seon, tomkadar@seon.io, www.seon.io.

KLARNA, a buy now, pay later provider, has expanded its in-store payment services to more than 60,000 U.S. locations. Brands include H&M, The North Face and Timberland. To pay in physical stores, customers use the Klarna app to create a one-time virtual card that gets added to their digital wallet. They then use their mobile device to make a contactless payment.

David Sykes is Head of U.S. at Klarna, david.sykes@klarna.com, www.klarna.com.

P97 NETWORKS, a provider of cloud-based mobile commerce technology, will enable mobile payments for fuel at Shell gas stations from within the updated Google Pay mobile app on Android and iOS devices.

Donald Frieden is CEO at P97 Networks, donald.frieden@p97.com, www.p97.com.

Card Fraud Losses Reach $28.65 Billion

Purchases of goods and services as well as cash advances and withdrawals (including on-us ATM activity) tied to global brand and domestic-market-only general purpose and private label credit, debit and prepaid cards worldwide amounted to $42.274 trillion in 2019, up 4.2% over 2018.

Gross fraud losses to issuers, merchants and acquirers of card transactions from merchants, as well as acquirers of card transactions from ATMs reached $28.65 billion, up 2.9% from $27.85 billion in 2018. That figure does not include billions of dollars in fraud losses tied to QR code-based and push payments (bank account to bank account transfers).

Dollars lost to fraud rise every year in the U.S. and worldwide. The measure of success against criminals attempting fraud is basis points per every $100 in total volume.

Card-based payment systems worldwide experienced gross fraud losses equal to 6.78¢ for every $100 of total volume in 2019. This was a decline from 6.86¢ per $100 the previous year.

In the United States, losses to fraud of $9.62 billion were up from $9.47 billion in 2018. However, fraud losses in the U.S. were 10.25¢ per $100 in total volume in 2019, down from 10.83¢ the previous year.

The U.S. accounted for 22.19% of total card volume worldwide in 2019 yet 33.57% of gross card fraud losses worldwide. One year before, the U.S. accounted for 23.33% of total card volume and 33.99% of total fraud.

For all other countries outside the U.S., fraud reached $19.03 billion in 2019, which equaled 5.79¢ per $100 in total volume. The prior year it was $18.39 billion and 5.77¢.

Losses to fraud mentioned here do not include expenses that issuers, merchants and acquirers incurred from operations, call centers and the investigation of fraudulent transactions. Those costs were up nearly 10% in 2019 over 2018. Merchants' operational costs related to fraud fighting include the fact that approximately 15% of card-not-present (CNP) transactions involve costly manual reviews of pending sales, even though 90% of those transactions are approved. About 40% of fraud mitigation costs involve manual review of CNP transactions.

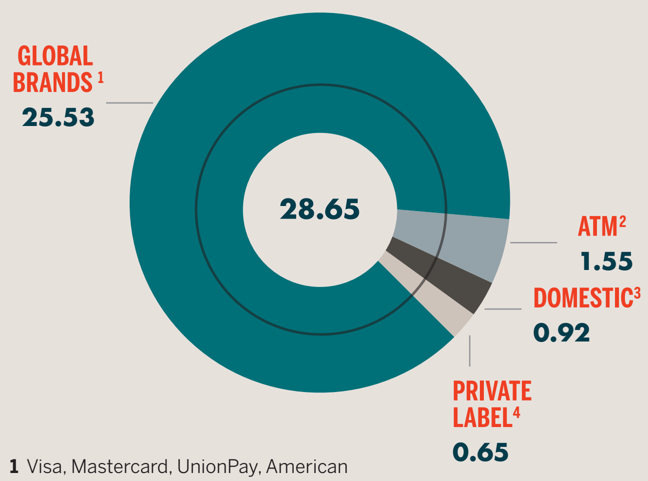
American Express, Diners Club/Discover, JCB, Mastercard, Visa, and UnionPay—the global general purpose brands—generated a combined $34.880 trillion in card volume (purchases and cash combined) in 2019, equal to 82.51% of the worldwide total.

Global brand card losses to fraud reached $25.53 billion in 2019, up 2.7% over $24.86 billion in 2018. Global brand cards accounted for 89.11% of total gross fraud losses worldwide in 2019, down from 89.26% in 2018.

→ p5

Fraud by Type of Card

$Billions in 2019



1 Visa, Mastercard, UnionPay, American Express, Diners/Discover, JCB. **2** From transactions processed by nonglobal networks. **3** Maestro, Elo, RuPay, Interac, Cartes Bancaire, Mir and 89 others. **4** Includes store, gasoline, airlines, medical, ACH debit, prepaid etc. ©2020 The Nilson Report

When the Nilson Report conducted its annual survey of global acquirer activity for 2019, it identified 89 general purpose domestic-market-only card brands worldwide. These brands are mostly debit only, some are credit only and a few are both. Credit and debit cards with these brands combined generated $4.524 trillion in total volume in 2019, up 13.1% over 2018. Domestic-only cards experienced gross fraud losses of $0.92 billion, an increase of 13.6% over 2018. They accounted for 3.2% of gross card fraud losses worldwide.

Private label payment cards usable only at retail stores, fuel outlets, airlines, medical and dental businesses and other select locations collectively accounted for $961.92 billion in total volume in 2019, up 6.6% over $902.60 billion the prior year. Fraud losses were $0.65 billion in 2019, up 7.8% from 2018. Private label card fraud accounted for 2.3% of all gross card fraud losses worldwide last year.

Other than the ATM networks (Cirrus, Plus, etc.) connected to the global general purpose card brands, credit and debit card transactions at ATMs generated $1.908 trillion in cash volume in 2019, down 2.0% from 2018. Fraud losses of $1.55 billion were down 1.8% from 2018. This ATM fraud equaled 5.4% of all card fraud losses worldwide.

By 2025, total payment card volume worldwide is projected to be $56.182 trillion, with gross card fraud globally expected to be $35.31 billion. Fraud per every $100 in total volume will have declined to 6.28¢. Losses to fraud in the U.S. are projected to reach $12.51 billion in 2025.

Card issuer fraud losses worldwide last year were $19.59 billion, an increase from $19.21 billion in 2018. Issuers accounted for 68.39% of gross fraud losses worldwide. The other $9.06 billion, which equaled 31.61% of total fraud losses, was a business expense of merchants, merchant acquirers and ATM acquirers.

Issuer losses occur when criminals take over existing card accounts, cards are lost or stolen or counterfeited, new accounts are opened purposely to commit fraud using a mix of valid and/or completely false information (synthetic fraud), cardholders or their family members make purchases that they subsequently dispute (friendly fraud) as well as a few smaller categories.

The ready availability of personally identifiable information (PII) for sale on the dark web supports account takeover and synthetic fraud losses. The value of annual sales of PII is in the $1-billion range. There were over 250 data breaches in the U.S. alone in 2019. Data breaches, particularly the theft of healthcare records that contain valuable PII, can provide the information needed for an account takeover. Quest Diagnostics, a U.S.-based healthcare company, was hacked in 2019, exposing nearly 12 million card accounts in addition to PII.

Criminals buy PII to obtain access to a valid credit card account. Once in, they have a new card mailed to a different address. Synthetic fraud, a worsening problem in the U.S., is the work of patient professional criminals. They build up large credit lines, typically at multiple issuers. Knowing the accounts they have opened could look suspicious, they sometimes wait 18 to 24 months before they strike. They might attack all accounts at once or bleed them in a steady stream.

Synthetic fraud looks like bad debt to credit managers. It is not counted in any fraud category. However, 20% of chargeoffs are linked to synthetic identity fraud.

Friendly fraud is another growing problem without an official category to count losses. This fraud, which can involve family, friends or acquaintances with access to a card account number, occurs in every country and grows along with the increase in online buying. Card issuers have dispute rights with friendly fraud but also bear high operational costs.

Losses to counterfeited cards created for use in retail stores or ATMs dropped in 2019. In the U.S., counterfeit card losses often occurred at fuel locations that were not EMV-compliant.

→ *p6*

Card Fraud Projected Worldwide

YEAR	Total Volume TRILLIONS	Fraud BILLIONS	Cents per $100 VOLUME
2015	$31.310	$21.84	6.97¢
2016	$31.878	$22.80	7.15¢
2017	$34.472	$23.97	6.95¢
2018	$40.582	$27.85	6.86¢
2019	$42.274	$28.65	6.78¢
2020	$42.241	$30.93	7.32¢
2021	$44.829	$32.04	7.14¢
2022	$47.627	$31.52	6.62¢
2023	$50.375	$32.96	6.54¢
2024	$53.245	$34.40	6.46¢
2025	$56.182	$35.31	6.28¢
2026	$59.284	$36.93	6.23¢
2027	$62.614	$38.50	6.15¢
2028	$66.188	$40.05	6.05¢

Magnetic stripes cheated unattended fuel pumps. When used to make an online payment anywhere in the world, stolen card data is sometimes counted as counterfeit card fraud.

Card-not-present purchase volume, which includes purchases made using mobile devices, equaled 15.4% of all purchase volume worldwide in 2019. However, it was tied to 65.0% of all losses to fraud. CNP fraud losses were up across the globe in 2019 with the growth of online sales.

Merchants overall did a better job fighting fraud in 2019. However, some high-volume, high-margin merchants as well as solely digital merchants remained willing to risk fraud if they got a valid card authorization. Merchants and issuers did catch more fraud attempts in 2019, and the percentage of successful fraudulent transactions fell.

Successful fraud fighting continued to be available to large merchants that were able to buy protection in layers of security. The global card networks found success fighting criminals through machine learning AI models able to analyze massive data sets, which spot fraud from organized crime immediately after it first appears and allows for immediate action. The networks have also gotten better at sharing data with law enforcement, issuers, merchants and acquirers.

Merchants pay for all fraud on CNP transactions except when 3D Secure protocol is involved. However, in 2019, 3D Secure acceptance was only in the 15% range in Europe. In the U.S., it was much lower. As online commerce grows, merchants will pay a steadily increasing percentage of total fraud losses. Tokenizing payments is critical to keeping merchant fraud losses and related operational expenses manageable.

Fraud at ATMs in 2019 continued to come from skimming, PIN compromise, dispenser jackpotting, cash trapping, malware, network packet switching and more. Fraud as a percentage of $100 in total volume declined slightly in 2019 from 2018.

Organized professional criminal gangs became more sophisticated in 2019. These gangs were from North Korea, Brazil, India, Nigeria, the Caribbean and Russian-speaking countries. Their fraudulent activities included injecting malicious code into JavaScript used at certain ecommerce sites to move data to another server, including moving data from a payment platform. The sophistication of organized criminals included reverse engineering the fraud fighting practices top merchants use to keep them out.

Prominent among organized criminal gangs is the Lazarus Group from North Korea, which brings military grade cyber expertise to card fraud. The gang's aim is to quickly monetize fraud. ATM cashouts involving counterfeit cards was its initial pursuit. More recently, Lazarus adopted a smarter fast-cash model involving compromising payment gateways and switches with man-in-the-middle software to authorize cash withdrawals. As Lazarus steals money from issuers, valid cardholders can concurrently make legitimate transactions. Card issuers are unaware fraud is occurring. An estimated 75% to 80% of all ATM cash-out fraud losses get repatriated to North Korea.

Social engineering attacks aimed at obtaining personally identifiable information (PII) increased in 2019. Having at least some PII helps criminals appear to be legitimate when they use email to conduct fraud. Efforts to gain PII include criminals posing as a bank representative and phoning cardholders—a practice known as "vishing."

Fraud in 2019 occurred with the help of automated botnets (software) deployed by criminals to test issuers and merchants for vulnerabilities.

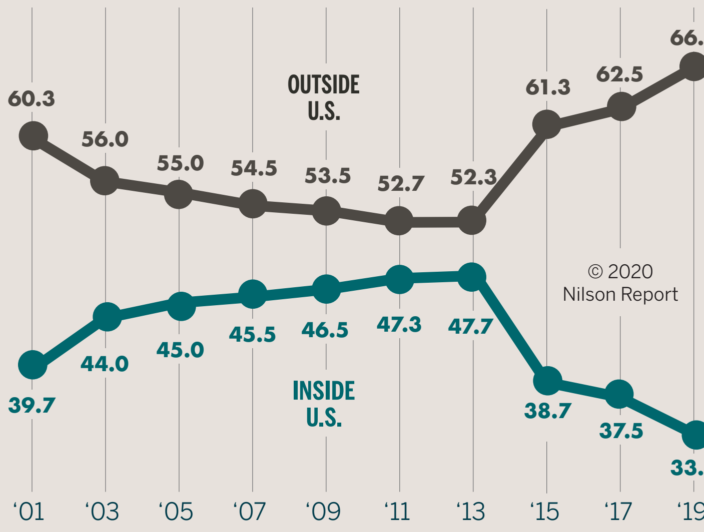
This practice is called account enumeration as well as credential stuffing. The botnets are programmed with some valid information, usually the 16-digit primary account number, which the criminals have stolen in a data breach. They are looking for the full data set to facilitate an account takeover or significant attack on a line of credit. The aim is to sell that full data set on the dark web. The software executes millions of attempted purchases to discover missing data elements such as postal codes, card expiration dates and CVV codes.

Criminals typically target smaller merchants for account enumeration. Larger merchants have software that catches those attacks.

Prior issues: 1164, 1142, 1118, 1096, 1068

Fraud Inside vs. Outside the U.S.

Market Shares (%) 2001—2019



Purewrist Wearables for Contactless Payments

Purewrist has launched a general purpose wearable payment product for users who cannot afford a $150 to $300 device such as an Apple Watch. The device can also be used in closed-loop systems such as stadiums and events. Purewrist sells the bracelet directly to consumers (B2C) as well as on a B2B basis.

Potential B2C customers include parents purchasing for children and others using the device to pay for public transportation. Purewrist expects B2B clients to include public transit systems and hospitality companies such as resorts.

Purewrist's product has two components. In addition to a silicone bracelet, the company produces a SIM card-sized Mastercard product with a contactless chip manufactured by NXP. Currently, the consumer places the chip in the bracelet, which is customizable and can be sold on a white-label basis.

Future developments could include other types of wearable products, such as ball caps and watch bands.

IN THIS ARTICLE

purewrist

Sutton Bank issues a prepaid Mastercard account on behalf of Purewrist, which acts as the program manager. I2c is the card account processor.

Consumers pay $25 to buy a Purewrist bracelet and select a pre-loaded amount of $10, $25 or $50. Once purchased, the consumer will be able to top up the card using Purewrist's app or website. The account will keep the same card number and physical chip.

The know your customer (KYC) process is handled when the card is topped up for the first time. Transfer of funds from a consumer's account to the Purewrist prepaid account is handled by Plaid.

Bracelets are available for sale in the U.S., and Purewrist plans to expand into South America, followed by the Middle East and Asia. The company plans expansion to markets that have mass transit programs that support contactless technology.

INTERVIEWED FOR THIS ARTICLE

Suresh Palliparambil is Chief Executive Officer at Purewrist in San Francisco, California, suresh@purewrist.com, www.purewrist.com.

Purewrist bracelet pricing starts at $35 and includes a preloaded amount of $10.

Global General Purpose Cards—Midyear 2020

Credit, debit and prepaid cards with Visa, UnionPay, Mastercard, JCB, Diners Club/Discover and American Express brands initiated 206.75 billion purchase transactions for goods and services worldwide from January 1 to June 30, 2020, an increase of 2.1% over the same period in 2019. Purchase transactions by debit and prepaid cards accounted for 59.06%, up from 55.77%.

Purchase volume for the first six months of 2020 amounted to $13.512 trillion, down 3.8% versus the same period in 2019. Credit card purchase volume was down 9.7%. Debit/prepaid purchase volume was up 3.5%. Credit cards held a 55.27% share of combined credit, debit and prepaid purchase volume, down from 55.67% in 2019.

When measuring combined credit, debit and prepaid card purchase transactions, the top market share was held by Visa with 41.78%, down from 43.67%. UnionPay gained share, moving to 29.53% from 27.43%. Mastercard's share increased to 25.27% from 25.07%. American Express went from 2.23% to 1.92%, JCB went from 0.91% to 0.87% and Diners Club/Discover dropped to 0.63% from 0.69%.

When measuring combined credit and debit card purchase volume, UnionPay held the top spot with a market share of 48.50%, unchanged from the same period in 2019. Market share for Visa increased to 30.23% from 30.00%. For Mastercard, its market share increased to 16.19% from 15.67%. Amex's share declined to 3.54% from 4.21%. JCB's share slid to 0.98% from 1.01% and Diners Club/Discover slipped to 0.56% from 0.61%.

Global General Purpose Cards

Figures are Midyear 2020 with Change vs. Midyear 2019

Brand	DOLLAR VOLUME (BILLIONS)						PURCHASE TRANS.	
	TOTAL	CHANGE	PURCHASES	CHANGE	CASH	CHANGE	BILLIONS	CHANGE
UnionPay Credit	$3,033.43	–8.5%	$3,024.75	–8.4%	$8.67	–32.2%	24.27	–6.8%
Visa Credit	$2,162.66	–11.0%	$2,062.48	–10.6%	$100.18	–18.1%	30.70	–6.4%
Mastercard Credit	$1,373.80	–7.5%	$1,288.02	–7.5%	$85.78	–6.5%	22.61	–1.7%
American Express Credit	$484.40	–19.2%	$478.42	–19.1%	$5.98	–21.0%	3.96	–12.4%
JCB Credit	$135.97	–7.2%	$132.23	–7.0%	$3.74	–15.0%	1.79	–2.8%
Discover/Diners Credit	$82.66	–11.2%	$76.06	–11.0%	$6.59	–12.8%	1.31	–6.9%
CREDIT CARD TOTALS	**$7,272.91**	**–9.9%**	**$7,061.96**	**–9.7%**	**$210.95**	**–14.4%**	**84.64**	**–5.5%**
UnionPay Debit & Prepaid	$3,717.13	0.0%	$3,527.86	0.4%	$189.27	–8.1%	36.78	24.7%
Visa Debit & Prepaid	$3,109.30	0.1%	$2,022.30	6.0%	$1,087.00	–9.2%	55.69	0.1%
Mastercard Debit & Prepaid	$1,573.49	5.0%	$899.49	11.2%	$674.00	–2.3%	29.64	6.7%
DEBIT CARD TOTALS	**$8,399.92**	**0.9%**	**$6,449.65**	**3.5%**	**$1,950.27**	**–6.8%**	**122.11**	**8.1%**
CREDIT & DEBIT TOTALS	**$15,672.83**	**–4.4%**	**$13,511.61**	**–3.8%**	**$2,161.22**	**–7.6%**	**206.75**	**2.1%**
Visa Totals	$5,271.96	–4.8%	$4,084.78	–3.1%	$1,187.18	–10.0%	86.38	–2.3%
Mastercard Totals	$2,947.29	–1.2%	$2,187.51	–0.7%	$759.78	–2.8%	52.25	2.9%
VISA & MASTERCARD TOTALS	**$8,219.25**	**–3.5%**	**$6,272.29**	**–2.3%**	**$1,946.96**	**–7.3%**	**138.63**	**–0.4%**
UnionPay Totals	$6,750.56	–4.0%	$6,552.61	–3.8%	$197.94	–9.5%	61.05	9.9%

Includes all consumer, business and commercial credit, debit and prepaid cards. Currency figures are in U.S. dollars. Change figures for dollar volume reflect a year-over-year comparison in local currency. Figures are for January 1 through June 30. American Express, JCB and UnionPay include business from third-party issuers. Visa includes Visa, Visa Electron, V Pay, Visa Direct and Interlink. Mastercard excludes Maestro and Cirrus figures. JCB figures are for October 1, 2019 through March 31, 2020, and are estimates.

$13.5 trillion
in purchase volume

▼ **4%**
versus the prior year

PNC to Acquire BBVA Payment Card Assets

PNC Bank's acquisition of BBVA USA Bancshares for $11.60 billion in cash, which is expected to be completed in mid-2021, will create the 5th largest bank holding company in the U.S.

PNC Bank ranked 11th largest in the U.S. among issuers of Visa and Mastercard credit cards at midyear 2020 based on outstanding receivables with $8.10 billion. BBVA was 29th largest with $1.04 billion. When combined, the new PNC will continue to rank 11th. It will have over 7.3 million credit cards in circulation. More than 95% are Visa cards.

PNC uses Fiserv (First Data) to process consumer card accounts and BBVA uses Global Payments (Tsys). BBVA's Finanzia USA subsidiary uses Fiserv for its credit cards. Global Payments handles commercial card processing for PNC and BBVA.

IN THIS ARTICLE

PNC

BBVA

Prior issues: 1171, 1170

Among debit card issuers in the U.S., PNC ranked 4th largest and BBVA 24th based on purchase volume (spending for goods and services). Combined, the purchase volume generated by cards issued by the banks exceeded $93.60 billion in 2019. The expanded PNC will have 12.3 million debit cards in circulation, nearly all with the Visa brand. PNC has small Mastercard commercial and consumer prepaid card portfolios.

In merchant acquiring, PNC ranked 8th largest in the U.S. based on purchase volume for all card types. However, Fiserv owns 40% of that business. BBVA ranked 26th largest. Fiserv owns that portfolio and provides all services to the merchants. The combined PNC/BBVA merchant business accounted for over $85 billion in card spending in 2019.

Top 150 Debit Card Issuers Worldwide

Purchase volume generated by the 150 largest issuers of debit cards totaled $10.476 trillion, an increase of 3.5% from $10.123 trillion in 2018.

The top 10 issuers contributed 62.4% of this year's volume. They were dominated by issuers from China, where most of the purchase volume was generated by UnionPay cards. The 6 issuers in China accounted for $5.244 trillion in purchase volume. The 3 U.S. issuers had $1.056 trillion and the single U.K. issuer had $238.40 billion.

→ p10

Largest Debit Card Issuers Worldwide

Ranked by Purchase Volume in 2019 & Country

RANK	ISSUER, COUNTRY	(BIL.)
1	**China Construction**, China	$1,889.64
2	**Agricultural Bank**, China	$1,089.38
3	**ICBC**, China	$994.12
4	**Bank of China**, China	$680.74
5	**China Merchants**, China	$391.25
6	**Wells Fargo**, U.S.	$363.78
7	**Bank of America**, U.S.	$346.58
8	**JPMorgan Chase**, U.S.	$345.57
9	**Lloyds Banking/MBNA**, U.K.	$238.40
10	**Bank of Communications**, China	$199.20
11	**Sberbank**, Russia	$177.08
12	**NatWest Group**, U.K.	$147.90
13	**Crédit Agricole**, France	$133.42
14	**Barclays**, U.K.	$132.79
15	**Credit Mutuel**, France	$108.24
16	**HSBC**, U.K.	$103.52
17	**HuaXia**, China	$87.72
18	**China Industrial**, China	$85.32
19	**Santander Cards**, U.K.	$83.03
20	**PNC Bank**, U.S.	$80.10
21	**Truist**, U.S.	$75.65
22	**U.S. Bank**, U.S.	$72.04
23	**China Everbright**, China	$66.31
24	**USAA**, U.S.	$65.64
25	**La Banque Postale**, France	$64.69
26	**The Bancorp Bank**, U.S.	$62.89
27	**China Guangfa**, China	$62.35
28	**Navy FCU**, U.S.	$59.31
29	**Commonwealth**, Australia	$56.28
30	**TD Bank**, U.S.	$51.51
31	**ICBA Bancard**, U.S.	$50.39
32	**Shanghai Pudong Dev.**, China	$48.87
33	**Swedbank Group**, Sweden[1]	$48.15
34	**Nordea Group**, Finland[2]	$48.00
35	**Nationwide Bldg. Society**, U.K.	$47.77
36	**DNB**, Norway	$47.65
37	**Regions Bank**, U.S.	$45.30
38	**UniCredit Group**, Italy[3]	$44.61
39	**ING Group**, Netherlands[4]	$44.02
40	**China Minsheng**, China	$43.86
41	**Fifth Third Bank**, U.S.	$42.55
42	**Caixa Economica Federal**, Brazil	$41.70
43	**MetaBank**, U.S.	$38.36
44	**BancoPosta**, Italy	$37.55
45	**Rabobank**, Netherlands	$35.27
46	**CaixaBank Paymts & Cons.**, Spain	$34.87
47	**Westpac Banking**, Australia	$34.56
48	**Nexi Payments**, Italy	$33.38
49	**Capital One**, U.S.	$33.31
50	**Itau Unibanco**, Brazil	$33.17
51	**Bank of Beijing**, China	$33.07
52	**Intesa Sanpaolo**, Italy	$32.92
53	**TSB**, U.K.	$31.45
54	**Banco Bradesco**, Brazil	$30.68
55	**Citizens Bank**, U.S.	$28.69
56	**KB Kookmin Card**, South Korea	$28.41
57	**SBI Bank**, India	$28.41
58	**Huntington Natl**, U.S.	$28.24
59	**Green Dot Bank**, U.S.	$27.00
60	**Citibank**, U.S.	$26.86
61	**BNP Paribas Fortis**, Belgium[5]	$24.69
62	**Comerica Bank**, U.S.	$24.63
63	**VTB Bank**, Russia	$23.66
64	**Banco Santander**, Spain[6]	$22.14
65	**BBVA**, Mexico	$20.95
66	**ABN Amro**, Netherlands	$20.75
67	**KeyBank**, U.S.	$20.60
68	**National Australia**, Australia	$19.97
69	**ANZ Banking**, Australia	$19.96
70	**Al Rajhi Bank**, Saudi Arabia	$19.59
71	**Banco Santander**, Brazil	$19.10
72	**NongHyup Bank**, South Korea	$18.85
73	**Banco do Brasil**, Brazil	$18.53
74	**Virgin Money/CYBG**, U.K.	$17.93
75	**Erste Group**, Austria[7]	$17.70
76	**Bankia**, Spain	$17.64
77	**BBVA**, Spain	$17.42
78	**OP Financial**, Finland	$16.73
79	**State Empl. CU (N.C.)**, U.S.	$16.43
80	**Alfa-Bank**, Russia	$15.42
81	**Belfius Bank**, Belgium	$15.24
82	**Danske Bank**, Denmark	$15.18
83	**Shinhan Card**, South Korea	$15.08
84	**M&T Bank**, U.S.	$14.90
85	**Allied Irish Bank**, Ireland	$14.24
86	**PostFinance**, Switzerland	$13.81
87	**BBVA Compass**, U.S.	$13.62
88	**BancoEstado**, Chile	$13.28
89	**HDFC**, India	$12.90
90	**Banc Sabadell**, Spain	$12.72
91	**Tinkoff Bank**, Russia	$12.15
92	**Banco Popular**, Puerto Rico	$12.09
93	**Standard Bank**, South Africa	$11.71
94	**Kuwait Finance House**, Kuwait	$11.69
95	**Santander Bank**, U.S.	$11.52
96	**Citibanamex**, Mexico	$11.19
97	**Bank Central Asia**, Indonesia	$11.19
98	**Caixa Geral de Dep.**, Portugal	$11.14
99	**Natl Bank of Kuwait**, Kuwait	$10.99
100	**Axos Bank**, U.S.	$10.95
101	**Co-operative Bank**, U.K.	$10.83
102	**TCF Financial**, U.S.	$10.80
103	**CU Settlement**, Australia	$10.76
104	**Banco Santander**, Mexico	$10.75
105	**Banorte**, Mexico	$10.58
106	**Bank Mandiri**, Indonesia	$10.36
107	**ICICI**, India	$10.26
108	**Arvest Bank**, U.S.	$9.73
109	**Natl Commercial**, Saudi Arabia	$9.59
110	**Russian Standard**, Russia	$9.55
111	**SEB Kort**, Sweden	$9.47
112	**Boeing Employees CU**, U.S.	$9.41
113	**Bank of the West**, U.S.	$9.35
114	**Bank Pekao**, Poland	$9.25
115	**BMO Harris**, U.S.	$9.04
116	**Piraeus Bank**, Greece	$8.96
117	**PKO Bank**, Poland	$8.78
118	**Millennium BCP**, Portugal	$8.67
119	**KEB Hana Card**, South Korea	$8.37
120	**UBS**, Switzerland	$8.28
121	**Raiffeisen**, Switzerland	$8.22
122	**First Citizens**, U.S.	$8.15
123	**National Bank**, Greece	$8.04
124	**Uralsib**, Russia	$7.99
125	**Deutsche Bank**, Germany	$7.82
126	**Bancolombia**, Colombia	$7.48
127	**Axis Bank**, India	$7.26
128	**SchoolsFirst FCU**, U.S.	$7.00
129	**BPCE**, France	$7.00
130	**First Horizon**, U.S.	$6.87
131	**UMB Bank**, U.S.	$6.82
132	**MUFG Union Bank**, U.S.	$6.74
133	**Zions Bancorporation**, U.S.	$6.71
134	**Alelo**, Brazil	$6.30
135	**Commerce Bank**, U.S.	$6.20
136	**Golden 1 CU**, U.S.	$6.15
137	**America First CU**, U.S.	$6.12
138	**FirstBank (Colo.)**, U.S.	$6.00
139	**Randolph Brooks FCU**, U.S.	$5.94
140	**Emirates NBD**, U.A.E.	$5.81
141	**VyStar CU**, U.S.	$5.76
142	**Mountain America FCU**, U.S.	$5.69
143	**People's United Bank**, U.S.	$5.49
144	**Lansforsakringar**, Sweden	$5.35
145	**Banco Santander**, Chile	$5.34
146	**Webster Bank (incl. HSA)**, U.S.	$5.16
147	**Woori Card**, South Korea	$5.16
148	**Suncoast CU**, U.S.	$5.14
149	**ANZ Bank**, New Zealand	$4.98
150	**DBS**, Singapore	$4.96

Purchase volume for calendar year 2019 on Visa, Maestro, Mastercard, UnionPay and domestic general purpose consumer and commercial debit and prepaid cards. **1** And Estonia, Latvia, Lithuania. **2** And Sweden, Denmark, Norway. **3** And Germany, Austria, Russia, Croatia, Bulgaria, Romania, Hungary, Czech Republic, Slovakia, Slovenia, Bosnia, Serbia. **4** And Belgium, France, Germany, Italy, Luxembourg, Poland, Romania, Spain, Turkey. **5** Includes Fintro and Hello Bank. **6** Includes SCF and Open Bank. **7** And Czech Republic, Slovakia, Hungary, Romania, Croatia, Serbia, Slovenia.

Krowd's Marketplace for Card-Linked Offers

Using proprietary deep learning and artificial intelligence algorithms, Krowd combines card transaction data with data from third-party sources to predict consumer reaction to merchant offers. The company's Offer Bidding Marketplace (OBM) for card-linked offers lets merchants bid on cardholders in real time, allowing for a campaign that can target for new or existing customers, age, gender, budget, offer level and offer conditions.

The company's technology supports traditional offers but also high-frequency and high-reward (food and beverage, health and beauty) offers. These offers are desired by cardholders but are harder to source because they tend to come from independent merchants, not the high-volume mass retailers typical of traditional card-linked offers. Krowd says its OBM can scale up to 10,000 merchants and 100 million cardholders per card client and that it can automatically adjust discounts for individual cardholder price sensitivity.

The ability to incorporate more than 250 million external data points on merchants (sourced from reviews, blogs, social media, menus) is integral to Krowd's self-learning merchant directory and knowledge graph. The technology supports highly predictive customer redemption results from personalized offers to targeted cardholders. Krowd claims its prediction algorithms are 50% more effective than those of its competitors and five times more effective than campaigns issuers operate in-house.

The offers are not only relevant to specific cardholders, but the auction method of OBM inclines merchants to make the offers more lucrative because they are in competition for cardholders with other merchants. Krowd claims its service increases consumer spend by as much as 18% and improves the merchant's return on marketing investment by up to 30%.

Krowd can extend its OBM offers outside bank communication channels, including integration with nonbanking apps such as those of restaurant and ride-hailing companies and mobile network operators.

Clients using Krowd's OBM include banks in the U.K. and U.A.E. Banks in India, Saudi Arabia and the U.S. will launch the marketplace in 2021. Krowd, a partner in Visa's Fast Track Program, has raised $1.5 million in seed funding from investors, including Barclays.

Issuers provide Krowd with a unique identification number for cardholders but not their primary account number or any personally identifiable information. Krowd needs transaction data including the merchant and the amount of a purchase. Issuers pay Krowd a set-up fee for OBM but no subsequent subscription fees. Krowd's revenue comes primarily from merchants that only pay on redeemed offers.

The OBM can be made available on a white-label basis to merchant acquirers. Krowd will share revenues with them. Issuers that also operate merchant acquiring portfolios can leverage the OBM for offers to their own cardholders or other bank partners.

IN THIS ARTICLE

krowd

INTERVIEWED FOR THIS ARTICLE

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Payment Card Shipments by Manufacturer

Of the 4.74 billion payment cards shipped in 2019 by the manufacturers shown here, 81.02% were chip cards (3.84 billion), 18.79% were magnetic stripe cards (891.3 million) and 0.18% (8.7 million) were neither chip nor magstripe (i.e, barcode, scratch etc.).

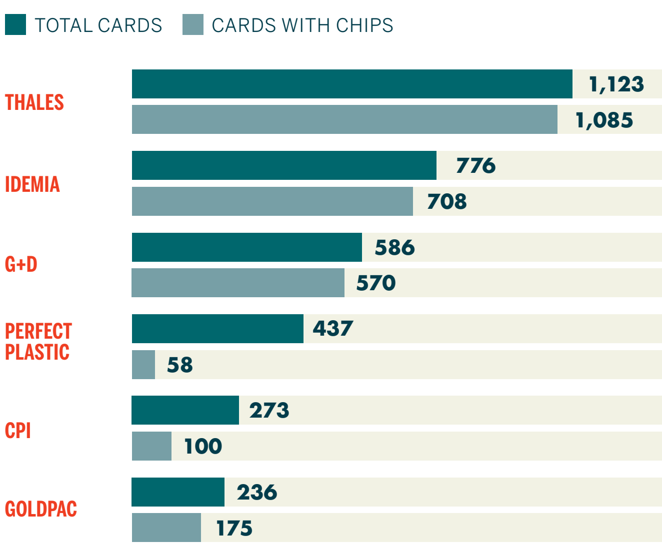
The six largest manufacturers shipped a combined 3.43 billion payment cards last year, up 6.6% from 2018. They shipped 2.70 billion chip cards and 735.3 million magstripe cards. Chip cards accounted for 78.57% of the top six's total in 2019, up from 76.82% in 2018.

Types of cards included: Visa and Mastercard; UnionPay; other high-security cards such as American Express, Diners Club, Discover, JCB and Maestro global general purpose credit, debit and prepaid cards in addition to ATM and local-market-only general purpose credit, debit and prepaid cards; and other payment cards such as retail, oil/fleet, medical, airline and private label credit and debit cards. Figures do not include private label prepaid cards.

→ p13

Top Manufacturers of Payment Cards

Ranked by Shipments in 2019 (Millions)



Card Manufacturers 2019

	PAYMENT CARDS	TOTAL	Payment Cards with Chips[1]			Mag-Stripe
RANK	MANUFACTURER, HEADQUARTERS	MIL.	RANK	MIL.	% OF TOTAL	MIL.
1	**Thales,** Netherlands	1,123.1	1	1,084.8	96.6%	38.3
2	**Idemia,** France	776.0	2	708.0	91.2%	68.0
3	**G+D Mobile Security,** Germany	586.0	3	570.0	97.3%	16.0
4	**Perfect Plastic Printing,** U.S.	437.1	11	58.1	13.3%	379.0
5	**CPI Card Group,** U.S.	273.2	8	100.1	36.6%	173.2
6	**Goldpac Group,** Hong Kong	236.3	5	175.5	74.3%	60.8
7	**Tianyu Information Industry,** China	177.5	4	177.4	100.0%	<0.1
8	**Eastcompeace,** China	170.0	6	154.4	90.8%	15.7
9	**Hengbao,** China	125.6	7	123.2	98.1%	2.4
10	**XH Smart Tech,** China	94.1	9	91.0	96.7%	3.1
11	**MCT Cards & Technology,** India	83.5	10	75.7	90.7%	7.8
12	**Valid,** Brazil[2]	63.9	13	52.4	82.1%	11.5
13	**Alioth,** Russia	55.6	12	55.5	99.7%	0.2
14	**Toppan Printing,** Japan	51.0	14	49.0	96.1%	2.0
15	**AustriaCard,** Austria	48.9	15	46.5	95.0%	2.4
16	**FutureCard,** United Arab Emirates	44.2	20	22.6	51.1%	21.6
17	**NovaCard,** Russia	41.4	16	40.5	97.8%	0.9
18	**Kona I,** South Korea	37.2	17	36.8	98.9%	0.4
19	**Plastkart,** Turkey	36.3	19	31.5	86.8%	4.8
20	**Tag Systems,** Andorra	35.3	18	33.8	95.8%	1.5
21	**Thomas Greg & Sons,** Brazil	33.9	38	0.8	2.3%	33.1
22	**PGP Group,** Hong Kong[3]	32.4	27	10.3	31.6%	17.0
23	**Exceet Card,** Germany	20.6	22	18.9	91.7%	1.7
24	**Hogier Gartner,** Colombia	20.4	21	19.8	97.1%	0.6
25	**Chanwanich Sec. Print.,** Thailand[4]	19.2	23	14.8	77.1%	4.1
26	**MK Smart,** Vietnam[5]	17.3	31	5.6	32.6%	9.9
27	**Placard,** Australia	14.8	32	5.5	37.5%	9.3
28	**Masria Digital Payments,** Egypt	13.3	24	13.3	100.0%	–
29	**Inkript Cards,** Lebanon	12.6	25	11.5	91.6%	1.1
30	**TGS Card Solutions,** Mexico	11.4	26	10.8	95.2%	0.5
31	**KL Hi-Tech Secure Print,** India[6]	10.9	29	8.1	74.8%	1.2
32	**Watchdata,** China	10.0	28	10.0	100.0%	–
33	**FoongTone Technology,** Taiwan	8.2	30	8.0	97.5%	0.2
34	**M-Tech Innovations,** India	5.4	33	5.4	100.0%	–
35	**Feitian Technologies,** China	4.5	37	2.0	45.2%	2.5
36	**Beautiful Card,** Taiwan[7]	4.0	34	4.0	98.7%	<0.1
37	**Taiwan Name Plate,** Taiwan	4.0	35	3.6	89.6%	0.4
38	**Toppan Forms Card,** Hong Kong[7]	2.8	36	2.8	99.6%	<0.1
39	**INCM,** Portugal	0.7	39	0.7	96.3%	<0.1

1 Chip card types include dual interface, microprocessor, memory and contactless. **2** Estimate. **3** Includes 5.2 million nonchip/nonmagstripe cards. **4** Includes 0.3 million nonchip/nonmagstripe cards. **5** Includes 1.7 million nonchip/nonmagstripe cards. **6** Includes 1.5 million nonchip/non-magstripe cards. **7** Includes some cards shipped to other manufacturers.

In addition to the payment cards shown here, six manufacturers reported shipping embedded secure elements: Toppan Printing (284,000), CPI Card Group (283,000), FoongTone Technology (141,801), Exceet Card (100,000), Chanwanich Security Printing (99,836), and Alioth (10,123).

Prior issues: 1166, 1163, 1143, 1139, 1121, 1116

4.74 billion payment cards were shipped in 2019... 81% had chips

81%

Visa and Mastercard

RANK	CARD MANUFACTURER	TOTAL MIL.	Chip MIL.
1	Thales[1]	1,123.1	1,084.8
2	Idemia[1]	776.0	708.0
3	G+D Mobile Security[1]	586.0	570.0
4	Perfect Plastic Printing	348.9	55.2
5	CPI Card Group[2]	273.2	100.1
6	Valid[3]	63.9	52.4
7	Toppan Printing[1]	44.5	44.5
8	Alioth	39.8	39.7
9	Plastkart	36.3	31.5
10	AustriaCard	36.2	35.4
11	FutureCard	36.0	20.0
12	NovaCard	34.5	34.0
13	MCT Cards & Technology	34.1	32.6
14	Tag Systems	30.9	30.4
15	Goldpac Group	28.3	14.7
16	Exceet Card	19.4	18.9
17	Kona I	19.0	19.0
18	Hogier Gartner	18.7	18.1
19	Eastcompeace	17.1	3.2
20	Thomas Greg & Sons	16.9	0.8
21	XH Smart Tech	16.3	15.7
22	Chanwanich Sec. Print.	11.5	9.6
23	Masria Digital Payments	11.3	11.3
24	Inkript Cards	10.3	9.5
25	TGS Card Solutions	7.9	7.5
26	Placard	7.9	4.7
27	FoongTone Technology	5.4	5.3
28	MK Smart	4.5	4.1
29	KL Hi-Tech Secure Print	3.7	2.5
30	Hengbao	3.4	1.0
31	Taiwan Name Plate	2.6	2.2
32	Toppan Forms Card Tech.	2.1	2.1
33	Watchdata	2.0	2.0
34	Beautiful Card	1.7	1.7
35	Tianyu Inform. Industry	1.0	1.0
36	INCM	0.7	0.7
37	M-Tech Innovations	0.3	0.3

1 Includes all cards for its bank clients.
2 Includes other payment cards. **3** Estimate.

UnionPay

RANK	CARD MANUFACTURER	TOTAL MIL.	Chip MIL.
1	Goldpac Group	172.5	157.1
2	Eastcompeace	152.9	151.1
3	Hengbao	122.2	122.2
4	Tianyu Inform. Industry	115.9	115.9
5	XH Smart Tech	26.5	26.5
6	Watchdata	8.0	8.0
7	Chanwanich Sec. Print.	4.8	4.8
8	Kona I	1.6	1.6
9	Toppan Forms Card Tech.	0.6	0.6
10	NovaCard	0.5	0.5
11	Feitian Technologies	0.2	0.2
12	FutureCard	0.2	<0.1
13	Alioth	<0.1	<0.1
14	Placard	<0.1	<0.1
15	MK Smart	<0.1	–

Other Payment[1]

RANK	CARD MANUFACTURER	TOTAL MIL.	Chip MIL.
1	Tianyu Inform. Industry	60.6	60.6
2	Perfect Plastic Printing	54.3	–
3	XH Smart Tech	35.7	34.5
4	Goldpac Group	32.5	2.1
5	PGP Group	17.1	8.9
6	AustriaCard	8.7	7.9
7	Toppan Printing	6.5	4.5
8	FutureCard	5.5	2.0
9	Feitian Technologies	4.3	1.9
10	Tag Systems	4.2	3.2
11	Chanwanich Sec. Print.	2.4	0.1
12	MK Smart	2.3	0.6
13	Masria Digital Payments	2.0	2.0
14	Placard	1.9	–
15	Exceet Card	1.2	–
16	Taiwan Name Plate	1.2	1.2
17	FoongTone Technology	0.5	0.5
18	NovaCard	0.2	0.2
19	Inkript Cards	0.2	0.2
20	Alioth	<0.1	<0.1
21	Toppan Forms Card Tech.	<0.1	–

1 Includes other payment cards such as retail, oil, airline, fleet, medical etc.

Other High Security[1]

RANK	CARD MANUFACTURER	TOTAL MIL.	Chip MIL.
1	MCT Cards & Technology	49.3	43.1
2	Perfect Plastic Printing	34.0	2.9
3	Thomas Greg & Sons	17.0	–
4	Kona I	16.6	16.2
5	Alioth	15.7	15.7
6	XH Smart Tech	15.6	14.3
7	PGP Group	15.4	1.3
8	MK Smart	10.5	0.9
9	KL Hi-Tech Secure Print	7.1	5.6
10	NovaCard	6.3	5.8
11	M-Tech Innovations	5.0	5.0
12	Placard	5.0	0.8
13	AustriaCard	4.1	3.2
14	TGS Card Solutions	3.4	3.3
15	Goldpac Group	3.0	1.6
16	FutureCard	2.5	0.5
17	FoongTone Technology	2.3	2.3
18	Beautiful Card	2.3	2.3
19	Inkript Cards	2.1	1.8
20	Hogier Gartner	1.7	1.7
21	Chanwanich Sec. Print.	0.6	0.3
22	Taiwan Name Plate	0.3	0.3
23	Tag Systems	0.2	0.2
24	Toppan Forms Card Tech.	<0.1	<0.1

1 Includes other high-security cards such as American Express, Diners, Discover, JCB, RuPay, Maestro, Mir, ATM and PIN-based debit cards.

All credit, debit and prepaid consumer and commercial card products on i2c's platform use a single code.

Cryptocurrency Cards Use i2c Processing

More than 30 cryptocurrency companies are expected to provide products and services that link digital assets (Bitcoin, Ethereum, Tether and others) to real-world spending through the Visa and Mastercard merchant acceptance networks by the end of 2021. Among those already in the market are Wirex, Apto Payments, Crypto.com and NetCents. All are clients of payment processor i2c.

Wirex provides over three million Mastercard cards linked to assets in a cryptocurrency wallet. It brought to market the first Bitcoin rewards card. The company is a direct issuer of Mastercard cards.

Apto Payments is a processor and value-added service provider focused exclusively on crypto companies that want to issue bank cards. Coinbase, which claims over 35 million customers worldwide, is an Apto client.

Crypto.com offers multiple financial services, including a Visa card, to over five million consumers.

NetCents, a money services business registered with Fintrac, is a hub for trading cryptocurrencies and a provider of the top crypto merchant gateway service.

Those four companies and i2c's other clients link to the company through a single API to access a front-end and back-end service stack as well as account lifecycle management services worldwide.

All credit, debit and prepaid consumer and commercial card products processed by i2c use a single code, making integration to the company's technology stack very simple and providing instant global reach.

U.K.-based Wirex has customers in 130 countries. Hong Kong-based Crypto.com has customers in Asia, 31 countries in Europe and the U.S. Apto's Coinbase client offers Visa cards (it is a principal member of Visa) in 29 countries.

The appeal of i2c to crypto and other companies that offer card products around the world includes the fact that its authorization system has never gone down in the 19 years it has been in business.

The real-time conversion of crypto assets to fiat currency to facilitate spending at Visa and Mastercard network merchants is not a service provided by i2c.

However, that process is not any more complicated than fiat-to-fiat foreign exchange processing for multicurrency card accounts, which i2c provides for clients including CIBC in Canada and City National Bank, Payoneer and Brex in the U.S.

Other i2c customers include Comerica, Credit Sesame, Car IQ and Purewrist.

IN THIS ARTICLE

INTERVIEWED FOR THIS ARTICLE
Jim McCarthy is President at i2c in Redwood City, California, jmccarthy@i2c.com, www.i2cinc.com.

Prior issues: 1185, 1180, 1170, 1169, 1168, 1163, 1145, 1142, 1135, 1130, 1124

Management Changes

- **Scot McClintic** has been appointed Senior Vice President of iGaming Product and Strategy at Paysafe, scot.mcclintic@paysafe.com.
- **Paul Horlock,** formerly at Pay.UK, has been appointed Chief Payments Officer at Santander UK, paul.horlock@santander.co.uk.
- **Kenneth Arakelian** has been appointed Senior Vice President and Chief Product Officer at Enacomm, kena@enacomm.net.
- **Louisa Murray** has been appointed Chief Operating Officer for the UK and Europe at Railsbank, louisa@railsbank.com.
- **Jia Min Tan** has been appointed Director of Business Development, APAC at Chargebacks911, j.min@chargebacks911.com.
- **Mariano Dima,** formerly at Visa Europe, has been appointed President at Soldo, mdima@soldo.com.
- **Frederick Crosby** has been appointed Chief Revenue Officer at Nium, frederick.crosby@nium.com.
- **Penelope Holt** has been appointed Vice President of Marketing at Sezzle, penelope.holt@sezzle.com.
- **Jonathan Bennett,** formerly at CashFlows, has been appointed Senior Vice President at Docomo Digital, jonathan.bennett@docomodigital.com.
- **Keith Toney** has been appointed Executive Vice President and Chief Data and Analytics Officer at Discover, keithtoney@discover.com.
- **Adams Conrad** has been appointed Principal at QED Investors, adams@qedinvestors.com.
- **Dustin Siner** has been appointed Chief Revenue Officer at Rev19 LLC, dustin@rev19.net.
- **Alexandre Gonthier** has been appointed Global Chief Strategy Officer at Trustly, alexandre.gonthier@trustly.com.
- **Dhivya Suryadevara,** formerly at General Motors, has been appointed Chief Financial Officer at Stripe, dhivya@stripe.com.
- **Sunil Bindal,** formerly at Tsys, has been appointed Senior Vice President of Corporate Development at Equifax, sunil.bindal@equifax.com.
- **John McLane** has been appointed President at Trustly, john.mclane@trustly.com.
- **Oliver Archer** has been appointed Chief Financial Officer at Miura Systems, oarcher@miurasystems.com.
- **Dave Faupel,** formerly at Sage, has been appointed Chief Marketing Officer at Priority Technology, dave.faupel@prth.com.

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The Wall Street Journal, Bloomberg, Forbes, Finextra, Kiplinger, Motley Fool, Ars Technica, Business.com, Yahoo Finance, Pymnts.com, Cnet and Cointelegraph all have something in common. Each of those publications has recently used Nilson Report data in its reporting. The reason is simple: our proprietary research. You see that research in every issue we publish.

David Robertson, Publisher
December 1, 2020