

# Contactless Payments Rising

An Investing Trend During Coronavirus

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It's been seven decades since the advent of the modern day credit card in 1950 by the Diners Club. Since then, numerous countries have jettisoned cash and pivoted towards digital payments as the conventional payment method. Technological advancements, data security enhancements, and consumer preference for convenience have all underpinned the secular trend of cash displacement and adoption of digital payments. In recent years, we have seen rapid global adoption of a superior form of digital payments: contactless payments (also known as "contactless", "tap to pay", "NFC payments"). Currently, consumers interact with contactless payments through two primary forms – contactless-enabled credit and debit cards, and mobile wallets (such as Apple Pay, Google Pay, and Samsung Pay).

While contactless payments are already popular in a number of countries globally, widespread adoption in the U.S. has lagged due to an underdeveloped payments infrastructure. In spite of this, U.S. adoption of contactless payments appears to have reached an inflection point over the past year as merchant acceptance has become more widespread and leading financial institutions have begun issuing contactless credit and debit cards. With the COVID-19 pandemic serving as a tailwind, we've seen an acceleration in the secular trends of e-commerce and contactless payments usage as consumers adopt social distancing measures to avoid contracting or spreading the virus. Hygienic concerns linked to the pandemic have triggered a pull forward in cash displacement and present a unique opportunity for contactless payments to penetrate small ticket payments (under \$25) where approximately 80% have heretofore been conducted in cash.<sup>1</sup> Contactless payments represent a powerful tool for the financial technology (also known as "FinTech") industry to digitize low-value, high-frequency cash payments and drive card volume growth, while also delivering a compelling value proposition for users and merchants. We are constructive on the trajectory of widespread adoption and in the following pages discuss our findings and potential investment implications for this rising FinTech trend.

# Back to Basics: What are Contactless Payments?

Contactless payments provide consumers with a way to pay for goods and services without inserting or swiping a card directly into a point-of-sale (POS) terminal, often via payment cards (credit or debit) or smartphone devices. Conducted using Near Field Communication (NFC) technology, contactless payments exchange encrypted data from your payment card or smartphone to a payment terminal or tag within close proximity, typically at a distance of less than 10 centimeters. Anytime you hold your iPhone near a reader to pay via Apple Pay for instance, or tap your credit card to pay rather than insert or swipe, you are using contactless payment technology. To be clear, this technology isn't a novel concept. For decades we've seen similar forms of technology utilized by merchants to manage warehouses, develop electronic access keys to buildings and automobiles, and process payment for mass transit. However, the popularity of the technology for consumer-facing financial transactions is steadily gaining popularity.

## CONTACTLESS PAYMENTS AT POINT-OF-SALE TERMINAL



#### Source: Unsplash<sup>2</sup>

The NFC connection between two devices uses radio waves similar to radio-frequency identification (RFID) labels used in stores, warehouses, and other wireless tracking applications. When making an in-store purchase using tap to pay, your payment card or smartphone acts as the active device, transmitting data to the passive device—the payment reader. Your payment credentials are encrypted using tokenization, which protects sensitive card information by replacing actual data with a randomly generated reference number.

NFC has key advantages over other wireless technologies, like Bluetooth and WiFi, that tailor its application to payments technology. Its superiority in pairing connectivity and lower-power consumption (ideal for passive devices) far outweigh its drawbacks in lower data transmission speed and range. Further, NFC can induce electric currents within passive devices, allowing active devices to power on the passive device when it comes into range. Bluetooth connections, on the other hand, can transmit data at further ranges (up to 10 meters, or 33 feet) and transmit data at higher speeds, but have a significant drawback due to manual pairing requirements which creates a huge inconvenience in what should be a seamless payment experience.

# Preceding Payment Methods: Out with the Old, In with the New

Prior to the introduction of dual-interface chips in cards, the most common card technology was the magnetic stripe. Magnetic stripe cards contain three horizontally stacked tracks, with each track holding different types of data pertinent to the account holder.<sup>3</sup> The magnetic stripe technology become prone to counterfeit fraud, as hackers became skilled at skimming and copying data from the back of the card. In order to counter the increasing fraud risk and liability mounting from unauthorized transactions, the industry transitioned to a new technology, the EMV (EuroPay, Visa, and Mastercard) chip, which holds an embedded microchip for encrypted data transfer when dipped into an EMV-enabled POS terminal. In an effort to promote the use of EMV payment cards, card issuers mandated an EMV liability shift in October 2015, which resulted in the transfer of responsibility for fraudulent losses from the card issuers to merchants in cases when the fraud occurred on an incorrectly processed chip card.<sup>4</sup> While EMV payment cards were extremely effective in cutting down on the fraud that plagued magnetic stripe cards, the user experience was clunky and labored, as anyone who has accidentally removed their credit card before the POS data transfer was complete can attest. Contactless payments, in many ways, achieved the best of both magnetic strips and EMV technologies, providing a seamless and frictionless payment experience similar to the magnetic stripe but without compromising the security of the transaction, as is accomplished with EMV.

# COVID-19: Driving Changes in Consumer Behavior

COVID-19 has precipitated material changes in consumer behavior and given rise to consumer preference for contactless payments. In an effort to limit the transmission of the virus between individuals, we've seen businesses limit in-store foot traffic and shift to curbside pickup, public transportation systems expand the acceptance of contactless payments solutions, and consumers eschew cash as a payment method for goods and services. While these are just a few of the changes we've experienced in our daily lives since the start of the pandemic, nearly six months later many consumers have become accustomed to these new practices. Why? Repetition creates habit. This isn't to say changing consumer behavior is easy. Naturally, as long as the behaviors we have work and meet our needs, it is often difficult to embrace change. But, as we discern a payments ecosystem propagating the shift to contactless and a public openly embracing and reporting positive experiences with tap to pay, we hold strong conviction in the continued adoption of contactless payments.

Strategically, the payments industry has identified several verticals as gateways to instilling regular usage of contactless payments among consumers. Visa and Mastercard have strongly promoted tap to pay usage in transit and quick service restaurants, seeing it as an avenue for engraining contactless payment habits for small ticket items. These verticals have high visit frequency, higher customer throughput, and low ticket amounts. The average American makes twelve cash transactions per month, and 55% of all transactions in the U.S. are under \$10.5 Contactless is a great tool for habit formation in digital purchases through everyday use cases such as transit. Further, it enables faster processing compared to swiping and affords users the ability to avoid touching surfaces. In July 2020, Visa announced it now offers tap to pay for public transportation in over 500 cities.

One area, in particular, that has seen a lift from the COVID-19 pandemic is existing contactless transaction limits. We've seen numerous countries, as well as Visa and Mastercard, announce tap to pay transaction limit increases. In fact, since the start of the year, 49 countries across Europe, the Middle East, and Africa have announced an average transaction limit increase of 131%.<sup>6</sup>

# Infrastructure: A Chicken and the Egg Problem?

The rise of new payment forms is dependent on the entire payments ecosystem—merchants, payment processors, merchant acquirers (merchant bank), issuing banks, and card networks—developing the physical and digital infrastructure, security, acceptance, and frictionless experience to permit ease of use for consumers. Poor execution within any of these elements can seriously impede user adoption. To provide some context, we've provided a graphic of a hypothetical consumer transaction below.

In order for new payment technology to achieve acceptance and adoption, it needs each participant within the payments chain to do their part. Merchants need an incentive to purchase and provide POS terminals enabled for both EMV chip cards and contactless payments, payment processors need to provide requisite hardware/software/compliance for a particular payment method to mer-

# CONSUMER

1. Cardholder pays Merchant \$100 at POS terminal

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# MERCHANT

2. Transaction details picked up by Merchant POS terminal

# **TRANSACTION FLOW**

Mapping an example of digital payments below, one can see all of the participants involved in what seems like such a simple process that we take for granted when we go to the grocery store and pay with our smartphone, smartwatch, or payment card. We believe the most significant investment opportunities exist within the payments ecosystem participants themselves, rather than the smartphone or smartwatch the consumer carries. More on the impact of contactless payments on each ecoystem player later in this paper.



## **PAYMENT PROCESSOR**

3. Payment Processor transmits payment details to Merchant Acquirer



MERCHANT 9. Merchant nets \$97.50 after interchange fees

# MERCHANT ACQUIRER

4. Merchant Acquirer sends payment details to Card Network



# MERCHANT ACQUIRER

8. Merchant Acquirer forwards authorization response to Merchant



# CARD NETWORK

5. Card Network forwards transaction details to Issuing Bank



# CARD NETWORK

7. Card Network routes transaction back to Merchant Acquirer



# ISSUING BANK

6. Issuing Bank receives and authorizes transaction request

Source: Bailard. The above should be used for illustrative purposes only.

chants, issuing banks need to provide consumers with products capable of utilizing the newest payment technologies, and the networks need to design protocols for utilization.

Globally, we've seen the rollout and uptake of contactless vary from country to country. Australia, Canada, the UK, and portions of Continental Europe were early adopters of EMV chip cards in the mid-to-late 2000s and early 2010s. By issuing dual-interface cards capable of contactless payments and being inserted into payment terminals, and by requiring EMV capable POS systems, many of these countries were early success stories in tap to pay. Key to their success was having merchant acceptance in place and contactless capable payment cards dispersed to consumers from the get-go.

Pivoting to the U.S., the rollout of contactless payments has been slow relative to the aforementioned countries. Beyond some niche use cases, contactless adoption was almost non-existent until 5 years ago. The reality of the situation was the U.S. had a serious chicken and the egg problem-an imbalance of contactless acceptance (NFC enabled terminals) and proper products issued to consumers (contactless cards). Culpability falls at the feet of the issuing banks. Banks were mandated to issue EMV compliant chip cards by late 2016 and most of them chose the minimalist path. They saved ~\$0.35 per card by sending consumers single-interface chip cards with no contactless antenna.7 Fortunately, the landscape has changed over the last year, and the top issuers in the U.S. are actively rolling out new contactless cards, with nearly 200 million in circulation as of June 2020. Further, the infrastructure dilemma has been meaningfully solved, with roughly 65% of U.S. in-person card transactions done at contactless enabled terminals, up from <5% in 2014.8 While starting from a small base, it should come as no surprise that Visa reported 150% yearover-year growth in contactless usage in the U.S. as of March 2020, as penetration of contactless cards grows.

# **Global Adoption**

We have discerned that once the infrastructure is in place to facilitate usage of contactless payments, consumers do so robustly. Looking at data points from other developed countries which have



rolled out contactless payments, we observe strong growth of contactless payments in those economies and an increase in digital payments. We note two takeaways: 1) It typically takes two to three years for contactless adoption to reach its inflection point, and 2) Contactless serves as a powerful catalyst in accelerating cash-to-card conversion. Countries where contactless was introduced earlier than the U.S. have seen strong adoption-Australia (~90%), Canada (~50%+), UK (>50%), Spain (~50%), Russia (>50%), Czech Republic (>90%), Hong Kong (~40%+), and Singapore (>65%). This indicates a global openness to nascent payment methods in which the checkout experience is more frictionless. Furthermore, contactless converts more small value payments from cash-to-card and drives engagement. According to Visa, close to 60% of global face-to-face transactions are tap to pay, excluding the U.S. And what's really exciting about tap to pay is that it offers clear proof of engagement growth from consumers, with an average lift of 20% in payment volume card spend for people who start using tap to pay.5

Turning to the U.S., contactless adoption and usage have lagged other markets. While as of 2018 the preferred payment method in the U.S. was heavily skewed towards card payments (62%) versus cash and check (38%), contactless payments comprised less than 1% of card payments.8 With the merchant infrastructure now in place and major card issuers rapidly scaling contactless card deployment to consumers over the past 12 to 18 months, the U.S. market looks poised for strong growth in contactless particularly given the trial run many consumers are getting due to the COVID-19 pandemic. A recent Mastercard Contactless Consumer Polling Survey found that 50% of U.S. consumers worry about the cleanliness of signature touchpads used at POS terminals, likely fueling the 51% of Americans who are

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Participants	Outlook	The Impact		
Payment Processors	Net Gainers	Cash-to-card shift and digitization of smaller ticket transactions through contactless adoption — driving transaction throughput and payment volume growth		
Mobile Wallets	Net Gainers	Ubiquity of smartphones, growing merchant acceptance of mobile wallets, and consumer aversion of cash as a result of COVID-19		
Networks	Net Gainers	Cash-to-card shift, strong competitive moat, and digitization of smaller ticket transactions through contactless adoption — driving transaction throughput and payment volume growth		
Issuing Banks	Mixed Effect	Beneficiary of contactless card rollout and adoption, however, lack of differentiation and efforts from neobanks to disintermediate will serve as a headwind		
Source: Bailard.				

now using some form of contactless payments. Of the new adopters, 88% said the process of paying with contactless is relatively easy.<sup>1</sup>

## Implications

Holistically, the entire payments chain stands to benefit from the secular cash-to-card trend and flow through to contactless payments. Below, we discuss several areas of the payments chain likely to have a more pronounced impact from uptake in contactless payments.

Payment Processors: Net gainers due to the pull forward of cash-to-card shift, resulting in an uptick in transaction volume growth and digitization of smaller ticket transactions. Payment processors typically provide merchants with services such as merchant accounts, POS terminals, and front-end and backend processing. In reality, offering a wide variety of alternative payment methods, such as contactless payments, has become commoditized. It's more of an ancillary service than a differentiator. Companies are shifting their resources towards building out more tech savvy and intuitive products that can integrate with a merchant's core software offering (e.g., a restaurant POS that provides software services such as table-management, employee management-and also includes payments). The legacy payment partners (Fiserv, Fidelity Information Services, and Global Payments) stand to benefit from their scale, double-sided exposure (issuer processing and acquirer processing), and growing overall pie. However, we expect them to face medium- to

long-term pressure from many of the FinTechs (Square, Adyen, PayPal, non-publics), which offer more robust technology products and services, to go along with a growing total addressable market.

Mobile Wallets: Net gainers due to growth of digital transactions, growing merchant acceptance, and smartphone prevalence. This group includes mobile and digital wallets from many of the largest tech players targeting the U.S. market, such as Apple, Samsung, Google, and PayPal. When a consumer uses a mobile wallet to make a purchase, the mobile wallet provider collects a small fee, roughly 0.15% on every \$100 spent, from issuing banks. Usage of these offerings are facilitated by the ubiquity of smartphones, with a global install base of roughly 4.5 billion. Still, the average country mobile wallet usage is just 4%.89 Further, we've seen a divergence in contactless payment forms between parts of Asia, in particular China and India, where quick response (QR) codes are preferred, and the U.S., Europe, and LATAM, where NFC payments are favored. QR code based transactions in those countries are dominated by payment platforms such as WeChat, Alipay, and Paytm. Within the U.S. market, Apple and PayPal seem the best positioned to tap into the growing contactless market opportunity. PayPal, with 300 million users and a base of 25 million merchants, remains positioned as the top digital checkout button and an e-commerce powerhouse within the U.S., with market share of approximately 34%.8 Catalyzed by COVID-19, PayPal has made a strong push into offline transactions through a combination of contactless cards, NFC payments via noniPhone wallets, and a new QR code offering across 28 countries. User engagement is key for PayPal, but we believe it will benefit from the rapid shift to e-commerce and make a competitive push into in-store payments. Alternatively, Apple appears uniquely positioned due to its massive smartphone install base, Apple Pay being pre-installed on iPhones, and tight control over the device's NFC technology used for contactless payments. Apple Pay accounts for about 5% of global card transactions and analysts project they could handle 1-in-10 such payments by 2025.<sup>10</sup> We've observed Apple Pay achieve scale and transaction throughput at a far faster pace than the other mobile wallets.

**Networks:** Net gainers due to a strong competitive moat and pull forward of cash-to-card shift, resulting in an uptick in transaction volume growth and digitization of smaller ticket transactions. We expect the success of contactless, whether mobile wallets or cards, to be welcomed by the payment networks, such as Visa and Mastercard. The networks have tremendous ties to the various tiers of banks throughout the country via co-branding relationships. As contactless cards get into the hands of consumers, the combination of hygienic concerns, ease of use, and enhanced data security measures should make the networks more disruption proof. Some have openly speculated that neobanks (digital banks) and FinTechs could disintermediate the large networks by creating their own closed network payment rails. However, to this point, not only has that yet to materialize, but we've seen a growing penchant for partnering with the networks. It serves as a viable go-to-market strategy for the neobanks and FinTechs due to the widespread acceptance, scale, and trust the networks provide. In theory, a company such as Apple or PayPal could cause headaches for the networks if they chose to lock them out from their mobile or digital wallet offering, build their own network (a huge undertaking), and brought all of the necessary issuer operations in-house. But, the viability of such an endeavor seems far-fetched at this point. Plus, the networks have many tools at their disposal with which to counter. Apple recently had an opportunity to go down that path when it rolled out the Apple Card (issued by Goldman Sachs and co-branded with Mastercard), but passed. Apple Pay and the Apple Wallet allow for multiple payment cards to be loaded in, including those where Visa or Mastercard are handling the transactions.

**Issuing Banks:** Mixed effect – stickiness of contactless card adoption but growing headwinds from neobanks to disintermediate them. While the issuing banks have a huge role to play in building out the product necessary for contactless adoption, it is unlikely they will be able to truly differentiate themselves in contactless cards. It is certainly true that penetration of small ticket items will drive cash displacement and boost digital transactionswhich should drive an increase in interchange fees to banks. Notwithstanding, legacy banks have a track record of dragging their feet and reacting slowly to changing consumer behavior and preferences. They will need to more proactively address rising demand for value-added services such as digital cards and increased demand for online loans, deposits and multi-currency accounts, if they hope to maintain customer loyalty and satisfy more than just the status quo.<sup>10</sup> Issuing contactless cards is necessary to improve cardholder satisfaction but not a significant difference marker for them, especially as neobanks successfully poach customers by offering faster card issuance, more value-added services, and perks.

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Eric joined Bailard in 2017. In his current role as a Portfolio Associate, Eric implements investment strategies and maintains client relationships. In addition, he assists the research group by performing equity research and analysis. He received his Bachelor of Science in Business Administration, Finance from the University of San Francisco in 2015. Prior to Bailard, Eric worked as an Associate for an alternative asset manager in San Francisco.



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#### **ABOUT BAILARD'S TECH TEAM**

With strong roots in the heart of the Silicon Valley and the San Francisco Bay Area, Bailard's technology and science team is focused on the forefront of innovation and value creation. The team of six combine their 19-years of average investment experience to deliver deep sector expertise and analyze the rapidly-advancing technology and science industries. Leveraging our "Man + Machine" approach through our proprietary systematic models and tools, fundamental research, and access to industry experts, we seek to deliver a portfolio of high-conviction technology and science stocks dynamically allocated across rising technology stars, science leaders, and core technology holdings. We believe that this domain and fundamental investment expertise—together with our in-house quantitative acumen—is a differentiated and powerful combination when applied to these dynamic, cutting edge market segments.

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