The Truth about Contactless Payments

Executive Summary

Contactless payments are an efficient and convenient way to purchase goods and services. Consumer uptake of this innovate technology has been strong and positive, providing benefits for merchants and customers.

As the volume of transactions rapidly grow, the level of fraud, as a percentage of this growth continues to decrease. Australian consumers will only continue to fuel this growth whilst they have the trust and confidence in the payment platform to do so. In order for Australia to continue to be at the forefront of payment innovation and adoption, ongoing investment and focus on security is critical.

Importantly, should any lost or stolen contactless card ever be misappropriated, any ensuing transaction is traceable and the consumer is protected by zero liability (if using MasterCard or Visa branded products).
Introduction

Technology and innovation are transforming the financial services industry. Financial institutions are striving to continually improve the customer experience with banking making it safer, easier, convenient and competitive. Once such innovation has been the introduction of contactless payments. But has this game-changing technology, which offers speed and convenience for consumers, made an impact on the safeguards from financial crime?

Innovation in Financial Services

Innovation within the financial services sector is being driven not only by existing organisations but also by the constant flood of new entrants into the global marketplace. Increased consumer uptake of new technologies, particularly mobile devices, has led to greater innovation in the sector, primarily in relation to payments, investments, credit facilities and user experience.

The financial services sector has embraced innovation in technology, services and platforms. This need to innovate is often referenced in the context of disruption - the change that occurs when new digital technologies and business models affect the value proposition of existing goods and services.

Understanding the disruptive context of a marketplace is essential in judging whether innovation is responding adequately to a market need. Without such an understanding, many companies may only act tactically on innovation.

Australia has benefited from global innovation applied locally, with Australian financial services being at the forefront of strategic innovation and disruption. Examples of this include Aussie Home Loans offering alternate sources of home loans from banks; numerous providers of alternative payment systems; online brokers offering low-cost stock market transactions; and now the digital currency revolution.

Australia’s payments landscape continues to change as technological advances impact on the way consumers pay. Today, the majority of cards are issued with the more secure chip technology as well as the traditional magnetic stripe; and many cards also offer contactless functionality.

About the Author

Nigel Phair is an influential analyst on the intersection of technology, crime and society. He has published two acclaimed books on the international impact of cybercrime, is a regular media commentator and provides executive advice on strategic digital issues. In a 21 year career with the Australian Federal Police he achieved the rank of Detective Superintendent and headed up investigations at the Australian High Tech Crime Centre for four years.

About the Centre for Internet Safety

The Centre for Internet Safety at the University of Canberra was created to foster a safer, more trusted Internet by providing thought leadership and policy advice on the social, legal, political and economic impacts of cybercrime and threats to cyber security.

The Centre is hosted within the Faculty of Business, Government & Law at the University. The University of Canberra is Australia's capital university and focuses on preparing students for a successful and rewarding career.

www.canberra.edu.au/cis
Two driving forces for consumer adoption of new payment technology are convenience and security. Australian consumers, whilst early and eager adopters of innovation in financial services, still seek high levels of trust, confidence and safety with their service provider. A prime example is EMV\(^1\), which is the global standard for credit and debit payment cards based on chip card technology. Often referred to as ‘chip and pin’ it has been deployed in over 80 countries and has been shown to reduce counterfeit card fraud. EMV cards generate a unique numeric code for every transaction which is the key to reducing fraudulent card activity. This non-negotiable component of the customer/financial services provider relationship is essential as the sector leads the way in increasing Australian productivity and user experience.

Innovation, such as the introduction of contactless payments provide benefits to consumers and retailers alike, in terms of higher levels of control and convenience for consumers and higher throughput for retailers.

Return on Investment

The Australian financial services sector benefits from the global investment on research and development to test, create and deploy innovative consumer and business experiences. This includes payments technology where the large scale of global payments means the investment can be leveraged in multiple markets.

In times of significant competition from existing players and start-ups, gaining a competitive advantage through enhanced customer experience is key, as well as it being imperative to measure the return on such an investment. The return on innovation investment may be calculated by comparing the profits arising from a new service, to the research, development and other costs generated in creating the service.

With regard to contactless payments there are other indirect costs involved, including the creation of cards; the purchase, rollout and audit of point-of-sale machines; fraud detection and analytics; and the marketing and education of the benefits and risks with such payments. These are ongoing and not-insignificant investments in both people and resources. Such efforts are inline with the introduction and ongoing functioning of other financial services technology, such as ATM use and internet banking.

Contactless Payments

Contactless payments\(^2\) are becoming increasingly common on a range of devices including pre-paid, debit and credit cards; wearable devices, such as watches and wristbands; and mobile devices, such as smartphones and tablets.

\(^1\) EMV is the global standard for credit and debit payment cards based on chip card technology taking its name from the card schemes Europay, MasterCard, and Visa - the original card schemes that developed it.

\(^2\) Contactless payments greater than $100 require a PIN verification.
The underlying technology for all of these contactless payment devices is the same. The contactless device contains an antenna so that when it is touched against a contactless terminal, it securely transmits purchase information to and from the terminal. They are designed to allow consumers to make low value transactions quickly and conveniently.

In Australia, there has been a 42% growth in contactless card accounts between 2014 and 2015, along with an increase in average frequency of use per unique contactless account. Contactless penetration has grown to the point where 74% of all MasterCard in-store transactions are now contactless. Specifically:

- 89% of tapped transactions are under $50.
- 67% of tapped transactions are below $25.
- 31% of tapped transactions are below $10.

Benefits for Merchants

The introduction of contactless payments has allowed merchants to enjoy an array of benefits. The primary benefits include lower costs (as a result of fewer requirements to handle cash), improved operational efficiencies, and reduced maintenance required by contactless readers. In merchant segments where speed and convenience are key to merchandising and customer service, contactless payments also translate into improved customer acquisition and retention.

Merchants also benefit from higher sales and customer satisfaction. The cost for a merchant for a contactless payment is $0.11 per transaction versus $0.20 for a contact transaction. Additionally, the time taken for a transaction to take place, with a contactless payment average of 20 seconds versus 38 seconds for a contact payment. As a 2 second change in tender time implies a one cent ($0.01) change in merchant costs, small efficiency gains or delays can make a large difference to the total resource cost of the transaction and to a merchants bottom line. Further illumination of the low costs per transaction of contactless cards is the merchant cost of card-not-present transactions of $1.28 for debit cards and $1.72 for credit cards.

By issuing secure contactless payment devices, financial service providers are not only supplying consumers with a more convenient payment mechanism, they are also increasing transaction volumes.

Contactless Versus Cash

In todays economy cash often attracts a discount for the purchase of a good or service. On a per transaction basis, cash appears relatively inexpensive compared to other payment methods and this may explain why some merchants promote the use of cash. However, the cost of cash is not trivial; measured as a proportion of the sales value at the average transaction size, the cost of a cash transaction is around 2.5%.

Due to the extraneous time costs involved, it costs small business around four times as much per transaction to accept payments than big business. There may, of course, be other motivations for encouraging cash payments; the business may need cash on hand to offer cash-out at the point of sale or to pay staff wages, or may prefer cash as it facilitates tipping.

The Truth about Contactless Payments.
Cash is also favoured in the ‘informal economy’, where businesses may prefer cash to keep transactions or revenue from being detected. Further, the cost of cash to merchants, which comprises mainly of costs such as time and wages, may be less visible than the costs of fees paid to payment providers.

The time associated for consumers with using cash is difficult to measure, but can include, for example, the time taken to obtain cash from an ATM or branch (and often not knowing how much to withdraw, leading to over compensating, which may result in over-spending) before making a cash payment to a merchant, as well as the time taken to monitor payments, such as the time used in reconciling ATM generated statements with purchases. There are also hygiene factors for the food industry when preparing food then dealing with notes and coins.

**Benefits for Consumers**

Contactless payments are safe and highly secure with the same protection as chip & PIN payments, making them safer than cash. Conveniently, Australian travellers can use contactless cards internationally wherever the retailer is displaying the contactless symbol.

Contactless cards and devices are embedded with multiple layers of security to protect consumers against fraud, with contactless only working when a card or device is within very close proximity of the terminal. This makes it virtually impossible for any details to be intercepted while in use. When a card or device is touched on a terminal, information is securely transmitted between the two.

Contactless terminals are designed to accept one card per transaction at any time. All contactless terminals are tested and certified to confirm that a card is only read once before the transaction is completed. As a safeguard, each transaction must be completed (accepted or declined) before another one can be entered into the contactless terminal. Where purchases are over $100 and the consumer uses the contactless component, the terminal will request a PIN be entered. Should any lost or stolen contactless card ever be misappropriated, any ensuing transaction is traceable and the consumer is protected by zero liability, neither of which is available with stolen cash.

Combining the total time consumers use to make payments with estimates of the value of this time suggest that the opportunity cost for consumers in making payments is about $2.6 billion per annum. Of this amount, per transaction, BPAY and cheque payments are estimated to be the most expensive payment instruments, at $0.60 per transaction. At the other end of the spectrum, the relative speed of contactless debit transactions impose a cost of $0.13 per transaction on consumers. Cash and credit card transactions are estimated to cost $0.18 and $0.19 per transaction.
Mobile Device Payments

The ability for mobile smart devices – particularly phones – to make payments has been around for some time. The use of phones to make contactless payments is increasing and is expected to increase over time, but they are some way off total transactional dominance. Mobile device payments will co-exist for some time with all other means of payment, including contactless credit cards and cash.

The core advantage with any contactless smartphone transactions is the potential for greater security, particularly when payments are made with phones featuring either built-in (via hardware or software) or SIM-based tokenisation capability.

As an example Apple Pay was announced alongside the latest generation iPhone 6 and 6 Plus devices. This is in stages of being made available at this point in time in the Australian market, the use of Apple Pay and digital wallets in general, is likely to see exponential increases in the near future. Presently, Apple allows customers to use their iPhone to scan a product barcode in an Apple store, pay using their credit card stored in iTunes and walk out of the store without dealing with a salesperson.

The next frontier for mobile devices is Host Card Emulation (HCE) that emulates a payment card on a mobile device using only software. HCE permits a mobile phone to perform card emulation on a Near Field Communication enabled device. Mobile security with PIN and fingerprint scanning minimises the opportunity to use contactless payment should the device be lost or stolen.

Mobile payment credentials were originally stored locally on the mobile device, HCE allows for these credentials to be stored in a remote, secure cloud storage environment and only accessed when needed. By moving the secure element to a remote environment, the complexities and associated costs are reduced, whilst security increases.

Payment Fraud

Ever evolving fraud trends require financial institutions to deploy new ways of detecting and managing crime associated with payments. The large uptake by consumers and the move to real-time transactions being performed on a global scale has required large investments in people and technology. As a result, fraud detection and security is an ongoing overhead as the payment environment becomes increasingly complex.

Total card fraud rates from 2013 to 2014 have increased from 46.6 to 58.8 cents for every $1000 spent. This is against an increase of 4% (to $624 billion) on the total amount spent by Australians on their cards. The majority of this increase is due to the rise in card-not-present fraud which on Australian cards has risen 42 per cent to $299.5 million, with two thirds of this ($200.6 million) occurring overseas.³

³ A type of credit card fraud in which the customer does not physically present the card to the merchant during the transaction.
These increases are influenced by a combination of factors including changes in the way people shop (Australian’s are spending more through online channels); changes in payments technology; and changes in criminal activities. As the volume of online payments increases, the volume of card-not-present fraud will increase.

The Parliamentary Joint Committee on Law Enforcement recently held an Enquiry into Financial Related Crime. Pursuant to the Committee’s functions they examined the effectiveness of current Commonwealth law enforcement legislation and administrative arrangements that target serious and organised financial related crime including money laundering and identity fraud. The Committee received written submissions and oral evidence from a range of stakeholders, including Australian police services. The Victoria Police submission, in part, stated:

There has been a significant increase in deception offences in Victoria since June 2013 driven by offenders committing multiple low value transactions with stolen credit cards in person and in store. This trend is likely to be driven by newer cards that are easier to use with fewer security features.

Victoria Police contend the increased technology, lack of guardianship and the perception that credit card fraud is a victimless crime is driving deception offences. The Victorian Government Crime Statistics Agency defines deception as:

Offences involving a dishonest act or omission carried out with the purpose of deceiving to obtain a benefit or avoid a disbenefit. This includes: Forgery and counterfeiting; Possess equipment to make false instrument; Obtain benefit by deception; State false information; Deceptive business practices; Professional malpractice and misrepresentation; Other deception offences.

Deception offences are not the domain of serious and organised financial criminals, who use their networks and ability to target much higher value criminal results. Low-level opportunistic criminals seeking items of value which can be quickly on sold – usually via the black market typically carry out these offences.

All other state, territory and federal police submissions to the enquiry did not raise the issue of deception offences and contactless payments. It is interesting to look at some of the recent statistics. The graph below lists the number of deception offences (remembering that multiple uses of the one contactless card fraudulently is defined as multiple offences, even though there may only be one victim) as reported by Victoria Police and the number of contactless payments made in Victoria.

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This statistic is derived by using the percentage of ‘credit card involved’ offences against the yearly Crime Statistics Agency Victoria number of Deception offences.

This statistic is derived by using the MasterCard statistic of the number of contactless payments as a percentage of physical card payments, divided by the APCA number of EFTPOS payments, divided by the population proportion of Victoria.
Contactless and Deception - Victoria

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<thead>
<tr>
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<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Deception Offences</td>
<td>3950</td>
<td>3890</td>
<td>5539</td>
<td>5292</td>
</tr>
<tr>
<td>Number of contactless transactions</td>
<td>n/a</td>
<td>37.2m</td>
<td>149.6m</td>
<td>352m</td>
</tr>
<tr>
<td>Percentage of offences against transactions</td>
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<td>0.01%</td>
<td>0.004%</td>
<td>0.002%</td>
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The statistics show a very low rate of fraud (significantly less than the total card fraud rate when measured as a percentage – and decreasing each year) against the volume of transactions. Interestingly, the number of cards with the ability to make a contactless payment has significantly increased during this time as has the number of contactless payments.

A Reserve Bank of Australia survey in 2010 revealed 8% of consumers possessing a card with contactless capability. The same survey in 2013 revealed two-thirds of consumers possessing such a card.³

Identity theft – a generic term to describe activities/offences in which a perpetrator uses a fabricated identity, a manipulated identity, or a stolen/assumed identity to facilitate the commission of crime – was raised by some respondents particularly the nexus to credit card related crime. However, the customer experience from a lost or stolen card was addressed to the Enquiry as:

Of the 1.1 million Australians and New Zealanders impacted by identity crime and misuse each year, the vast majority of these individuals experience credit card fraud. The vast majority of this cohort need to respond to transactions that occur using only their credit card credential information, not personal information that can be easily linked to an individual. The response to such events is typically non-invasive, and leads to the suspension of a card itself, a typically quick investigation by the financial institution, and a replacement card re-issued.⁵

At Chapter Six, the report of the Enquiry into Financial Related Crime states many submitters and witnesses discussed the significant role that technology plays in facilitating financial related crimes. The report also states that new technology had effectively expanded the scope for credit card fraud from more traditional credit card fraud, to multiple low value purchases to evade detection. Though in evidence the ANZ bank stated:

[T]he PayWave mechanism itself is not a large driver of fraud losses for consumers or the banks. It is actually very popular
with consumers too, because it is very convenient, and it is popular with merchants because it is fast. And at the moment with the low thresholds on that mechanism I do not think it is a realistic large threat to fraud losses. I think some of the other issues we have been discussing are much bigger threats in terms of financial loss and customer inconvenience.\textsuperscript{xii}

In its final deliberations the Committee believed that banks and other financial service providers ought to consider law enforcement issues more carefully, and to facilitate discussions with law enforcement about new technologies prior to rollout. Interestingly the banking & finance sector and the Australian policing services hold quarterly meetings, hosted by sector members comprising of broad agendas surrounding technology enabled crime, international experiences in fraud, new technologies and how participants can better cooperate.

The committee recommended that consumers should have the option of disabling contactless payment features. Specifically, Recommendation 12 states:

> The committee recommends that financial institutions which issue debit and credit cards create an ‘opt in’ function that requires customers to consent to contactless payment technology features being activated on their cards.

An ‘opt in’ scheme would be impractical solution and would not reduce fraud (deception) rates. This is demonstrated via:

1. Poor customer experience – when consumers receive their card they may not understand what to do to activate (or not) the contactless component as a subsection of having the card itself initiated.
2. Impractical for customers – Will they have to attend a bank branch and show 100 points of ID for each card they possess to have the contactless component activated? (This would also be the same impracticality in an ‘opt out’ scheme.
3. People want contactless – With ¾ of physical card transactions performed as contactless, Australian consumers have demonstrated their willingness to adopt innovation.
4. Fraud – petty criminals target people for any value, often in spur of the moment theft. They will not rationalise against committing a crime on the off chance they may find a card that does not have its contactless function enabled.

Contactless payments may over time reduce the fraud rate of other card crime, for example in 2013 card skimming accounted for $9.8m in losses.\textsuperscript{xiii} The majority of skimming occurs when a consumer loses sight of their card, for example at a restaurant, the use of contactless payments requires the card to always be in the possession and sight of the owner.
The United Kingdom

The United Kingdom – a similar cultural, economic and consumer society – has higher card fraud rates than Australia. In 2014 the UK saw an increase in card fraud rates from 71 pence to 74 pence in every £1,000 spent. Card-not-present fraud on UK cards also increased from £246.0 million to £301.1 million.\textsuperscript{xiv}

Electronic Pickpocketing

Another issue which gains some media attention is the concept of ‘electronic pickpocketing’ where a fraudster uses a concealed RFID reader to steal credit card data from unsuspecting people walking by. The level of investment and effort required makes this type of crime particularly difficult.

Even if such data was able to be collected EMV cards use CVC3\textsuperscript{6} in the chip, which makes it nearly impossible to duplicate a card or ‘replay’ transactions. This is because a code that accompanies an authorisation request changes every time an authorisation request is made. This is a key point. For every transaction made with a Contactless card, there is a discreet authentication code that changes after each transaction. Without the proper code the transaction will not be authorised. Electronic pickpocketing also would not reveal a cardholders name making it even more difficult to make any form of payment.

Regulatory Efforts

Users of electronic payment facilities in Australia are protected by the ePayments Code. This code complements other regulatory requirements, including financial services and consumer credit licensing, advice, training and disclosure obligations under the Corporations Act 2001 and the National Consumer Credit Protection Act 2009.

This code regulates consumer electronic payments, including ATM, EFTPOS and credit card transactions, online payments, internet and mobile banking, and BPAY.

ASIC is responsible for the administration of the ePayments Code. ASIC monitor subscribers’ compliance with the code and review the code regularly. Almost all banks, credit unions and building societies in Australia are subscribers to the ePayments Code and is the reason why consumers who are victims of contactless fraud have their money reimbursed by their financial institution.

In relation to the reimbursement of funds, the code states:

\begin{quote}
A [card]holder is not liable for loss arising from an unauthorised transaction where it is clear that a user has not contributed to the loss.\textsuperscript{xv}
\end{quote}

\textsuperscript{6} This provides validity in a transaction.
Personal Responsibility

Obtaining a debit or credit card is a conscious decision made by consumers. It comes with not only personal responsibilities regarding purchasing decisions and budgetary considerations, but also the protection of the card itself and the account against fraud.

As explained above there has been regulatory efforts to protect consumers, but consumers need to take some personal responsibility along the way. Some tips for consumers to protect card accounts include:

- Record card account numbers and keep this list in a safe and secure place.
- Be careful on who has access to account numbers.
- Keep copies of purchase receipts.
- Notify the issuing bank immediately if unauthorised use or fraudulent use of the card is suspected.
- Never write down the pin, always memorise it and never give it to anyone else.

Cards need to be treated like cash, with the same level of common sense in their use and storage. Some tips for consumers to reduce the likelihood of fraud include:

- Safeguard the card and the wallet/purse it is stored in at all times.
- Never leave the purse or wallet unattended in public.
- Notify the issuing bank immediately if the wallet/purse is stolen.
- Make sure the mail box where cards and statements are posted is secure and always locked.

Merchants also have an important role to play in protecting themselves and their customers from online card fraud using simple techniques such as a fully hosted payment gateway to accept card payments securely and watching out for unusual or suspicious transactions.

Collaboration

The Australian Payments Clearing Association and law enforcement agencies have established the Fraud in Banking Forum to encourage closer collaboration between the financial services and law enforcement communities to combat the growing threat of fraud. The intention is to share information at a strategic level on current and emerging banking fraud issues and trends including new methods used by fraudsters.

The Australasian Cards Risk Council comprising of all the banks and schemes also conducts a quarterly meeting with state police agencies to share innovation, fraud trends and intelligence.
Conclusion

There is an evolution in global payments occurring which are following a number of themes, all leading toward a cashless society. These key themes include:

- The demise in the use of cash for payments
- A corresponding rise of electronic card-based payments
- An influence of contactless payment mechanisms on future consumer preferences, and the appeal of digital wallets.

Most financial sector companies have developed the technology to help identify fraudulent card activity and will act quickly to stop misuse once they discover it.Whilst this reduces significant fraud, like other crime types, there will always be a level of wrongdoing associated with the use of cards and technology. There is no technical, policy or legislative silver bullet to stop this.

*This research and analysis has been funded by MasterCard Australasia. The author contacted MasterCard, Visa and APCA seeking statistics and industry trends.

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3 *ibid*
5 *ibid*
6 Above, N ii
7 Australian Payments Clearing Association. 2015. *Australian Payments Fraud – Details and Data.*
8 *ibid* Victoria Police submission to the Parliamentary Joint Committee on Law Enforcement into Financial Related Crime.
11 ICare submission to the Parliamentary Joint Committee on Law Enforcement into Financial Related Crime.
13 *ibid*
14 Above, N vi. Australian Payments Clearing Association. 2015. *Australian Payments Fraud – Details and Data*
15 Above, N vi. Australian Payments Clearing Association. 2015. *Australian Payments Fraud – Details and Data*