

# Trends in Payments, Clearing and Settlement Systems

The Payments System Board monitors trends in retail payments, and activity and risk exposures across financial market infrastructure (high-value payment systems, securities settlement systems and central counterparties), consistent with its responsibilities to promote efficiency and competition, and control risk, in the Australian payments system.

## Retail Payments

### Cash payments

The use of cash has continued to decline relative to other payment methods as consumers shift to electronic payment methods, including for low-value payments. Despite this, cash still accounts for a material share of consumer payments, particularly small transactions, and is used intensively by some segments of the community. Although the transactional use of cash is declining, the demand for cash more generally has continued to grow; cash is widely used as a store of wealth, often for precautionary purposes.<sup>6</sup> The value of banknotes in circulation increased by 5 per cent in 2016/17, slightly below its long-term trend growth rate of 6 per cent; at the end of June there were 1.5 billion banknotes worth \$73.6 billion in circulation.

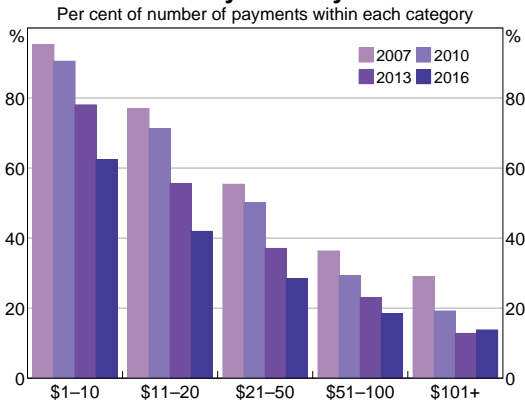
In 2016, the Reserve Bank conducted its fourth triennial Consumer Payments Survey (CPS), which provides comprehensive information on the day-to-day use of cash and other payment

methods in the Australian economy (see 'Box A: 2016 Consumer Payments Survey'). The share of consumer payments made in cash reported in the CPS fell to 37 per cent of the number of payments in 2016, from around 70 per cent in the 2007 survey. The latest survey indicated that credit and debit cards combined overtook cash as the payment method most frequently used by Australian consumers. However, when measured by the value of payments, the relative use of cash was broadly unchanged compared to the 2013 survey, at around 18 per cent. Between the 2013 and 2016 surveys, the decline in the use of cash relative to other payment methods was largely due to consumers using cards more frequently for in-person payments, with contactless 'tap and go' cards increasingly being used instead of cash for lower-value payments. Nonetheless, cash still accounted for over 60 per cent of payments under \$10 in 2016 (Graph 1).

As transactional use of cash has declined, people are carrying less cash in their wallets and making fewer ATM withdrawals. In the 2016 CPS, around one-fifth of respondents said they did not hold any cash at the beginning of the survey week (compared with 8 per cent in the 2013 survey). Data reported to the Bank by financial

<sup>6</sup> For more information, see: Davies C, M-A Doyle, C Fisher and S Nightingale (2016), 'The Future of Cash', RBA *Bulletin*, December, pp 43–52 and Doyle M-A, C Fisher, E Tellez and A Yadav (2017), 'How Australians Pay: Evidence from the 2016 Consumer Payments Survey', Research Discussion Paper 2017-04.

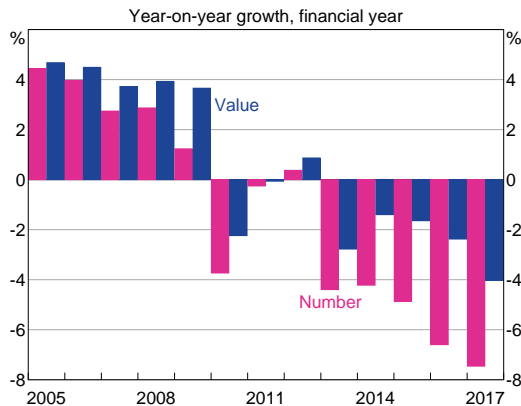
**Graph 1**  
**Cash Payments by Size**



Source: RBA calculations, based on data from Colmar Brunton, Ipsos and Roy Morgan Research

institutions indicate that the number and value of ATM withdrawals declined by 7 per cent and 4 per cent, respectively, in 2016/17, faster rates of decline than in the previous few years (Graph 2). The average value of ATM withdrawals has

**Graph 2**  
**ATM Withdrawals**



Source: RBA

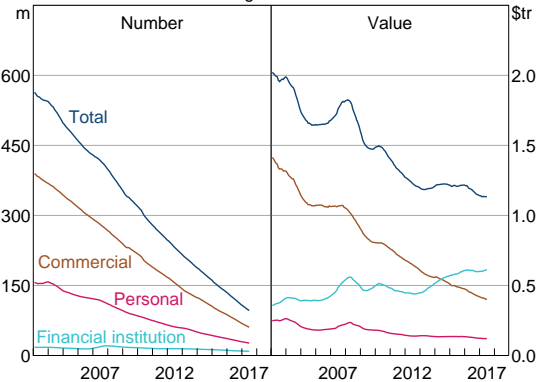
steadily increased from around \$180 in mid 2012 to around \$215, possibly because cardholders are economising on their use of ATMs in order to avoid direct charges. The rate of growth of ATM numbers has slowed in recent years, consistent with the decline in ATM use and associated pressures to rationalise networks; according to the Australian Payments Network (AusPayNet),

there were around 32 000 ATMs in Australia at the end of March. The number of cash-outs at the point of sale has also been declining since 2012/13.

### Cheque payments

The decline in cheque use has continued, with the total number of cheque payments falling by around 20 per cent in 2016/17 (Graph 3). The number of cheque payments in Australia has declined by around 85 per cent over the past two decades. Cheques currently account for only around 1 per cent of the number of non-cash payments and around 7 per cent by value, with cheques most often used for relatively large transactions. The decline in cheque use has been influenced by changing consumer preferences and technological innovations. With developments such as the New Payments Platform (see 'Box B: New Payments Platform'), e-conveyancing for property-related transactions, and increasing use of electronic payments, the shift away from cheques is likely to continue. As this occurs, the per transaction costs of supporting the cheque system will continue to rise. The Australian Payments Council is considering options for managing the decline in the cheque system as part of its Australian Payments Plan.

**Graph 3**  
**Cheque Payments**



Source: RBA

## Box A

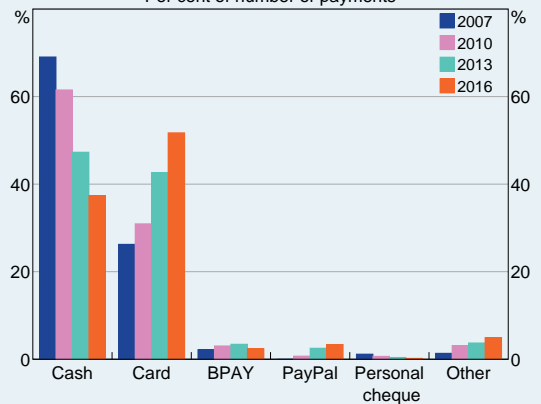
# 2016 Consumer Payments Survey

In November 2016, the Reserve Bank undertook its fourth triennial Consumer Payments Survey (CPS).<sup>1</sup> The survey provided a detailed snapshot of Australian consumers' payment behaviour. In 2016, over 1 500 people recorded details of every consumer payment they made over a week. The CPS showed a continuation of the trend towards the use of electronic payment methods in preference to paper-based methods such as cash and cheques. In 2016, credit and debit cards combined were the most frequently used method of payment by Australian consumers, accounting for just over half of the number of transactions (Graph A1). The data suggest that overall, Australian consumers made around 690 payments per person in the 2016/17 financial year.

The increase in the use of cards relative to other payment methods since the 2013 CPS has been facilitated by the widespread adoption of contactless 'tap and go' functionality by consumers and merchants at the point of sale. Around one-third of all point-of-sale transactions were conducted using 'tap and go' functionality in 2016, which is more than triple the share reported by participants in the 2013 survey. In particular, contactless cards are increasingly being used instead of cash for low-value payments. The ability to make contactless payments using a mobile phone rather than a physical (plastic) card is a relatively new feature of the payments system and this technology was not widely used at the time of the 2016 CPS. Consumers did, however, use smartphones for a higher share of their online payments.

1 Doyle M-A, C Fisher, E Tellez and A Yadav (2017), 'How Australians Pay: New Survey Evidence', RBA *Bulletin*, March, pp 59–65 and Doyle M-A, C Fisher, E Tellez and A Yadav (2017), 'How Australians Pay: Evidence from the 2016 Consumer Payments Survey', RBA Research Discussion Paper, No 2017-04.

**Graph A1**  
**Consumer Payments**  
Per cent of number of payments



Source: RBA calculations, based on data from Colmar Brunton, Ipsos and Roy Morgan Research

Although a decline in the use of cash for payments was observed across different demographic groups and merchants, cash remains the most common payment method for certain types of transactions, and is used intensively by some segments of the community. For instance, many older Australians continue to use cash for a significant share of their payments, and cash remains the most commonly used payment method at small food retailers such as cafes, restaurants and bars. Around 12 per cent of respondents made all of their point-of-sale payments using cash in 2016, a similar share as in the 2013 survey.

The use of personal cheques continued to decline, consistent with the aggregate data on cheque use reported earlier. Cheques accounted for 0.2 per cent of the number of consumer payments made by participants in the 2016 CPS, compared with 0.4 per cent in 2013. According to the survey, cheque use remains concentrated among older Australians, though fewer cheques are being written by consumers of all ages.

## Box B

# New Payments Platform

In 2012, the Payments System Board concluded a strategic review of innovation in the Australian payments system. The review identified a number of gaps in Australia's retail payment system and called on the industry to determine the best way of addressing these gaps. In response, a consortium of 13 Australian financial institutions, including the Reserve Bank, committed to build the New Payments Platform (NPP). The NPP is a fast payments system that will enable close-to-immediate funds availability to payment recipients on a 24/7 basis, even where the payer and payee bank with different financial institutions. The NPP will enable more information to be attached to a payment – instead of the 18 characters currently available, users will be able to send up to 280 characters, providing richer and more useful remittance information. It will also facilitate easier addressing of payments using the 'PayID' service; instead of having to use a BSB and account number, payers will be able to direct their payments to a more easily remembered mobile phone number or email address that a payee will have the option of linking to their account. When it is fully operational, it is expected that all financial institutions will be connected to the NPP, either directly or indirectly, and the vast majority of accounts will be able to send and receive NPP payments.

Payments made through the NPP will be settled individually in real time using a new settlement service built by the Reserve Bank, the Fast Settlement Service (FSS). The central NPP infrastructure is being built under contract by SWIFT but will be run as an industry utility by NPP Australia Limited, which is owned by

the 13 financial institutions that funded the development of the NPP.<sup>1</sup> Customers will access the NPP through commercial services offered by their financial institutions. The first such 'overlay' service is being developed by BPAY. Known as 'Osco', it will offer customers the ability to send payments from their bank account to another with close to real-time funds availability, via an online or mobile phone application provided by their financial institution. Over time, it is envisaged that a range of other payment services, developed by different players, will connect to the NPP to offer a variety of payment options tailored to particular contexts and addressing a range of customer needs. The layered architecture of the NPP was designed to facilitate innovation in overlay services from a wide range of participants.

The NPP will be a significant improvement to Australia's payments system infrastructure. Its development has been a substantial, multi-year undertaking by the industry. Development has progressed well, despite the size and complexity of the project. The project is now into the final testing phases and initial functionality is expected to commence operations around the end of 2017 with additional services to be rolled out in 2018 and beyond. The Bank completed its development of the FSS in 2016/17, on time and within budget, and it is now operating in test mode as part of the broader industry testing of the NPP infrastructure.

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<sup>1</sup> SWIFT is a global, member-owned cooperative that provides a communications platform and other services to process payments and exchange information. It is used by many payment systems, other financial market infrastructures and numerous other entities in the financial system.

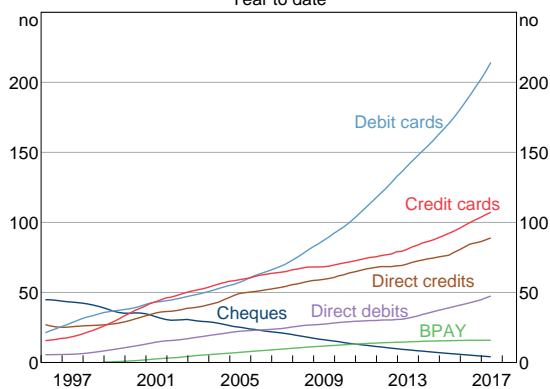
As noted, the Bank has played a number of roles in the development of the NPP and will continue to do so when it is operational. Having encouraged the development of the NPP as an industry response to its Strategic Review of Innovation,

the Payments System Board will have an ongoing policy role to play in overseeing the operation of the NPP and ensuring that it meets the objectives that were set for it.

## Electronic payments

The use of electronic payment methods continues to increase (Graph 4). On average, Australians made around 470 electronic transactions per person in 2016/17, up from around 430 transactions per person in the previous year. Direct Entry payments account for the bulk of electronic payments by value, while card payments make up around two-thirds of the number (Table 2).

**Graph 4**  
Non-cash Payments per Capita  
Year to date



Sources: ABS; AusPayNet; BPAY; RBA

## Debit and credit card payments

Debit and credit cards combined are the most frequently used payment method. In 2016/17, Australian personal and business cardholders made around 7.8 billion card payments worth \$571 billion, increases of around 13 per cent and 6 per cent, respectively from the previous year. While the number and value of card payments continue to grow, the average value

of these transactions has fallen somewhat over time, reflecting the increased use of cards for low-value payments. This trend is consistent with both changing consumer preferences and a greater willingness of merchants to accept cards for low-value transactions.

Growth in the number and value of debit card transactions continues to outpace growth in credit card transactions (Table 2). The majority of debit card payments are now made through the international (MasterCard or Visa) debit schemes, while eftpos' share of transactions has been steadily declining. This predominantly reflects the shift to contactless transactions with eftpos not offering contactless functionality until relatively recently.

The past year has seen significant rollout of mobile payments technology that enables mobile devices, such as smartphones, to be used to make contactless payments using an electronic representation of a debit or credit card, as opposed to a traditional plastic card. A number of financial institutions are now offering this functionality, some through third-party mobile wallets, such as Apple Pay and Android Pay, and others by integrating it into their own mobile banking applications (see the chapter on 'Retail Payments Regulation and Policy Issues'). Though mobile payments still account for a very small share of all payments, a little over 10 per cent of respondents to the 2016 CPS said they had made a mobile payment before, or were interested in making them; this share was a little higher for those respondents aged under 30 (15 per cent).

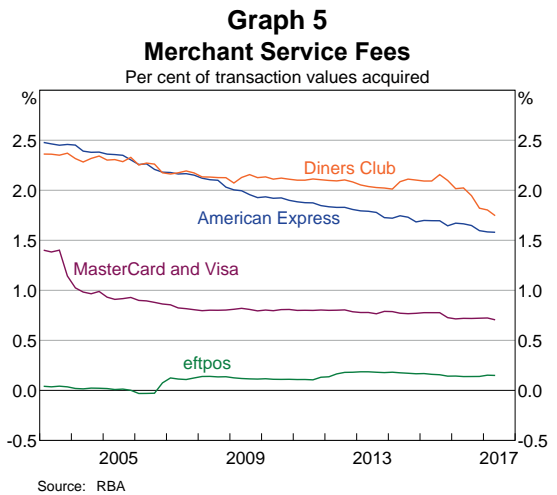
**Table 2: Non-cash Payments**

	2016/17						Average annual growth 2011/12–2016/17	
	Per cent of total		Average value	Growth (per cent)		Per cent		
	Number	Value	\$	Number	Value	Number	Value	
Debit cards	44.7	1.5	50	14.3	9.1	13.2	9.9	
Credit cards	22.4	1.8	120	9.1	4.1	8.7	4.8	
Direct credits	18.7	51.9	4 045	6.9	5.4	7.1	4.9	
Direct debits	10.0	35.7	5 226	13.0	3.4	11.1	0.5	
BPAY	3.3	2.2	980	1.9	8.1	3.9	9.7	
Cheques	0.9	6.8	11 490	-21.0	-4.2	-16.1	-1.6	
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>1 460</b>	<b>10.7</b>	<b>4.1</b>	<b>9.7</b>	<b>2.8</b>	

Sources: BPAY; RBA

Merchant fees for international scheme cards have declined steadily since the early 2000s (Graph 5). The average fee paid by merchants to their financial institution for transactions on MasterCard and Visa credit and debit cards was broadly unchanged over 2016/17 at around 0.7 per cent of the transaction value. This follows a decline over the previous financial year, coinciding with the reset in interchange fees in November 2015. The average fee for American Express transactions declined by 8 basis points in 2016/17 to 1.58 per cent, while there was a relatively large fall of 28 basis points in the average fee for Diners Club transactions, to 1.75 per cent.

The average merchant service fee for eftpos transactions increased by 1 cent in 2016/17 to be around 10 cents per transaction. This corresponds to a rate of 0.15 per cent for the average eftpos transaction, which remains well below the rate for transactions over the international schemes' debit networks. However, as eftpos fees are generally charged as a flat amount per transaction, for some low-value transactions, these fees can be higher than the ad valorem rates applying to transactions over the international schemes.



The level of merchant fees is heavily influenced by wholesale interchange fees paid from merchants' banks to cardholders' banks. Interchange fees also influence the level of cardholder fees and benefits, for instance in the form of rewards. The Bank's new interchange fee standards came into effect on 1 July 2017 after being announced as part of a package of reforms in May 2016. The reforms also included changes aimed at improving the transparency of payment costs to merchants and preventing excessive surcharges by merchants (see the chapter on 'Retail Payments Regulation and Policy Issues' for more details).

## Direct Entry and BPAY payments

Direct Entry payments account for the bulk of the value of non-cash retail payments. The high average value of these payments reflects their use by businesses, corporations and governments for a range of bulk payments, for example, salary and welfare payments. According to the 2016 CPS, Direct Entry payments are increasingly used for person-to-person transfers. Direct debit arrangements are also used extensively by consumers and businesses to make recurring payments.

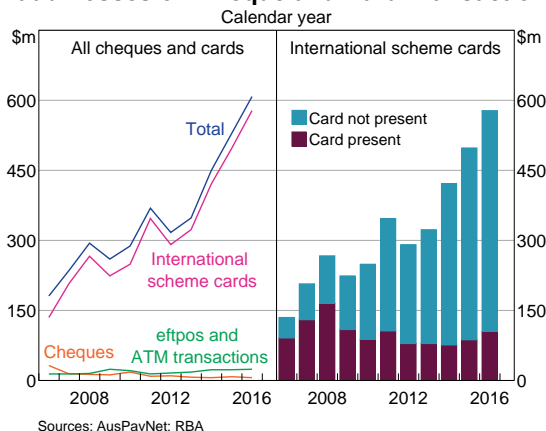
In 2016/17, the number and value of BPAY transactions increased by 2 per cent and 8 per cent, respectively. Consumers and businesses use BPAY to make a range of bill payments, including for utilities, education fees and investments. BPAY payments are much less common than card payments, but the high average value of these payments means they account for a greater share of the value of electronic retail payments than credit and charge cards.

## Payments fraud

According to data collected by AusPayNet, total losses from fraudulent cheque and debit, credit and charge card transactions (where the card was issued and/or acquired in Australia) increased by 15 per cent to \$608 million in 2016 (Graph 6). The estimated fraud rate (the value of fraudulent transactions as a share of overall transactions) increased to 32 cents per \$1 000 transacted, from 27 cents in 2015. As was the case for the past few years, the overall increase in fraud was principally driven by an increase in fraud on debit, credit and charge cards issued by international schemes, which rose by 16 per cent to \$578 million in 2016.<sup>7</sup> Losses relating to fraudulent eftpos and ATM transactions rose by \$1 million to \$24 million

<sup>7</sup> Fraud statistics for 'international scheme' debit, credit and charge cards relate to transactions through the MasterCard, Visa, American Express and Diners Club schemes.

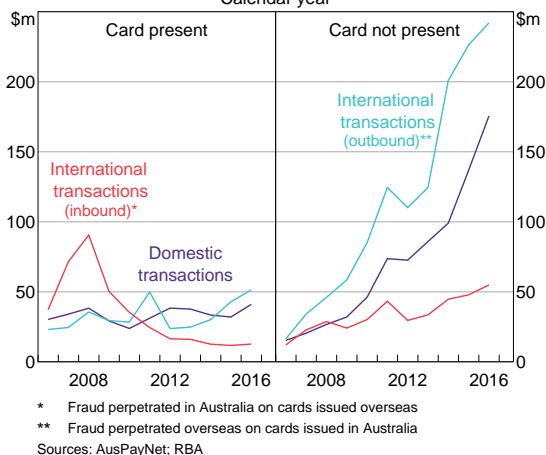
**Graph 6**  
Fraud Losses on Cheque and Card Transactions



in 2016, while cheque fraud fell by \$2 million to \$6 million.

Fraud losses continue to be driven by the fraudulent use of international scheme cards in the card-not-present (CNP) environment (i.e. online, via telephone or mail); this kind of fraud rose by 15 per cent in 2016 to \$473 million. CNP fraud perpetrated overseas on Australian cards accounted for 42 per cent of all fraud on international scheme cards in 2016 (Graph 7).

**Graph 7**  
Scheme Fraud Losses



\* Fraud perpetrated in Australia on cards issued overseas

\*\* Fraud perpetrated overseas on cards issued in Australia

Sources: AusPayNet; RBA

The fraud rate for CNP transactions is estimated to be around 8 times the rate for card-present transactions. The industry has recently been considering initiatives to address the steep rise in CNP fraud, particularly online card fraud. Key measures include the implementation of stronger risk-based customer authentication and fraud detection systems and the development of fraud prevention education programs aimed at small online merchants. The development of a trusted digital identity framework in Australia, which is currently under discussion, could also help combat CNP fraud, together with the use of emerging technologies such as biometrics for customer authentication and transaction tokenisation to provide greater security to card details.

Card-present fraud losses for domestic scheme transactions rose by \$9 million in 2016, largely due to an increase in lost/stolen card fraud and an increase in card skimming. Despite this increase in fraud losses, the rate of card-present fraud has declined over the past few years since the introduction of chip and PIN technology.

Reflecting the increase in CNP fraud, the overall fraud rate across all cards increased from 74 cents to 82 cents per \$1 000 transacted in 2016. While this fraud rate is close to that recorded in the United Kingdom, it is high compared with most other European countries, many of which have rates of card fraud that are less than half of that observed in Australia.

The Board has previously taken the view that measures to address fraud are principally a matter for industry, given the incentives that participants have to reduce fraud rates. However, a level of coordination in efforts to reduce fraud can be desirable, and barriers to effective coordination can arise. Accordingly, and reflecting the continuing rise in fraud rates, the Bank will be considering whether there are any actions that it may be able to take to facilitate or

encourage industry efforts to address growing CNP fraud rates.

### High-value payment and settlement systems

In Australia, the final settlement of Australian dollar (AUD) interbank obligations occurs across exchange settlement accounts through the Reserve Bank Information and Transfer System (RITS). RITS facilitates settlement of payments on a real-time gross settlement (RTGS) basis. Foreign exchange transactions involving the AUD are generally settled through CLS Bank International (CLS), with AUD funding paid to CLS through RITS. Together these two systems settle the majority of payments in Australia by value. RITS also facilitates the interbank settlement of the payment leg of securities transactions. Securities settlement involves delivery of the security in exchange for payment, typically through a securities settlement facility (SSF).

### Reserve Bank Information and Transfer System

Over 70 per cent of the value of non-cash payments in Australia is settled on an RTGS basis in RITS (Table 3). RITS also settles time-critical payments to other financial market infrastructures, such as margin payments to central counterparties (CCPs) and debt and equity settlement obligations to SSFs. In 2016/17, the average daily value of RTGS transactions in RITS rose by 5 per cent to \$175 billion and the average daily number of transactions increased by 3 per cent to over 46 000. The peak value settled on an RTGS basis on a single day during 2016/17 was \$258 billion.

Although RITS is primarily an RTGS system, it also facilitates the multilateral net settlement of interbank obligations arising from other systems. These include non-cash retail payments – such as cheques, Direct Entry payments and card transactions – most of which are netted



**Table 3: Transactions Settled in RITS**  
Daily average, 2016/17<sup>(a)</sup>

	Number <sup>(b)</sup>	Value <sup>(b)</sup>	Interbank settlement value in RITS
	'000s	\$ billion	\$ billion
RITS RTGS	46.4	175.0	169.1
SWIFT payments	43.0	105.1	105.0
Austraclear <sup>(c)</sup>	3.3	57.0	51.3
RITS cash transfers	0.2	12.8	12.8
CLS	53.6	261.2	2.7
Retail payments	46 154.0	67.1	4.3
Direct entry <sup>(d)</sup>	14 709.9	60.2	
Cheques	395.0	4.5	
Credit/charge cards <sup>(e)</sup>	10 357.2	1.3	
Debit cards	20 692.0	1.1	
Equity settlements (CHESS) <sup>(f)</sup>	1 053.1	9.6	0.5
Property settlements (PEXA) <sup>(g)</sup>	–	–	0.1

(a) Business days

(b) Includes payments between customers of the same financial institution

(c) Primarily debt securities transactions; includes cash-only transactions; excludes intraday repurchase agreements

(d) Includes BPAY

(e) Includes MasterCard obligations which are not settled through LVSS

(f) Gross value of equity trades settled in CHESS, ASX's clearing and settlement system for cash equity trades

(g) Net value of property settlement batches; each property settlement batch may involve a number of payments

Sources: ASX; CLS; RBA

through the RITS Low Value Settlement Service (LVSS). Direct entry makes up the majority of the value of retail payments through RITS. RITS also accepts transactions which are netted outside RITS: cash equity transactions through CHESS, ASX Settlement Pty Limited's (ASX Settlement) equities settlement system; Mastercard's AUD domestic obligations; and property settlement transactions, managed by Property Exchange Australia Limited (PEXA).

### CLS Bank International

CLS is an international payment system that links the settlement of the two legs of a foreign exchange transaction. By operating such a payment-versus-payment settlement mechanism, CLS allows participants to mitigate foreign exchange settlement risk, i.e. the risk that one counterparty to a transaction settles

its obligation in one currency, but the other counterparty does not settle its obligation in the other currency. CLS currently settles 18 currencies. The daily average value of AUD settlements at CLS increased by around 1.5 per cent in 2016/17.

### Securities settlement facilities

In Australia, ASX Settlement Pty Limited (ASX Settlement) provides SSF services for ASX-quoted cash equities, debt products and warrants traded on the ASX and Chi-X Australia Pty Ltd (Chi-X) markets. ASX Settlement also provides SSF services for non-ASX listed securities quoted on the IR Plus Securities Exchange Limited, the National Stock Exchange of Australia, and the Sydney Stock Exchange Limited. The average daily value of cash equity settlements through

ASX Settlement increased by 6 per cent in 2016/17 to \$9.6 billion.

Austraclear Limited (Austraclear) provides SSF services for trades in debt securities, including government bonds and repurchase agreements. In 2016/17, the average daily value of debt securities settled in Austraclear increased by 4 per cent.

### Central counterparties

CCPs play a major role managing the risks associated with trading in financial instruments. CCPs stand between the counterparties to a financial trade, acting as the buyer to every seller and seller to every buyer. Participants in cleared markets have credit and liquidity exposures only to the CCP, rather than other participants in the market.

In the absence of a participant default, the CCP is not exposed to market risk as it stands between counterparties with opposite (i.e. offsetting) positions. However, in the event that a participant defaults, the CCP must continue to meet its obligations to its surviving participants. In such an event, the CCP faces potential losses from changes in the value of a defaulting participant's portfolio until it closes out the positions in that portfolio.

To mitigate the risk of such losses, CCPs maintain prefunded resources, typically in the form of initial margin and default funds. Initial margin, which is collected from participants, is sized to cover potential future losses on a participant's portfolio in the event they default, to a specified confidence interval. As such, initial margin provides a risk-based measure of the magnitude of exposures faced by CCPs. Default funds (comprising contributions from participants and/or the CCP itself) are available to cover losses if, in

the event of default, the defaulting participant's margin is exhausted.<sup>8</sup>

Four CCPs are licensed to provide services in Australia:

- ASX Clear Pty Limited (ASX Clear) provides CCP services for ASX-quoted cash equities, debt products and warrants traded on the ASX and Chi-X markets, equity-related derivatives traded on the ASX market and Chi-X quoted warrants traded on Chi-X
- ASX Clear (Futures) Pty Limited (ASX Clear (Futures)) provides CCP services for futures and options on interest rate, equity, energy and commodity products traded on the ASX 24 market, as well as AUD-denominated over-the-counter (OTC) interest rate derivatives (IRD)
- LCH Limited's (LCH Ltd) SwapClear service provides CCP services for OTC IRD<sup>9</sup>
- Chicago Mercantile Exchange Inc. (CME) is licensed to provide CCP services for OTC IRD, and non-AUD IRD traded on the CME market or the Chicago Board of Trade market for which CME permits portfolio margining with OTC IRD.

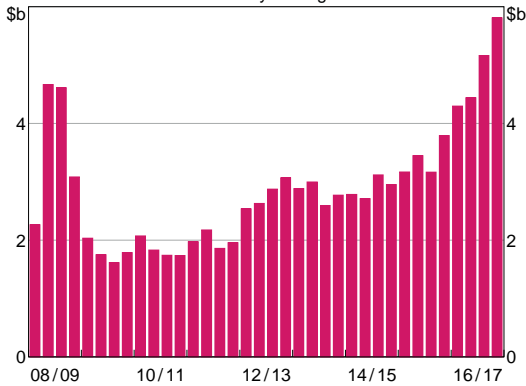
### Exchange-traded products

As noted above, the ASX CCPs clear exchange-traded futures and options, as well as cash equities. Exposures at ASX Clear (Futures) grew strongly over 2016/17 to \$5.9 billion as measured by margin held (Graph 8). These exposures primarily arise from the four major contracts on the ASX 24 market – the SPI 200 equity index future, the 3-year and 10-year Treasury bond

<sup>8</sup> CCPs also call variation margin to cover the exposure to actual changes in market prices, to prevent the build-up of current exposures. It is collected from participants with mark-to-market losses, and typically paid out to participants with gains.

<sup>9</sup> Until June LCH Ltd was also authorised to provide CCP services for the FEX market, which is not yet operational.

**Graph 8**  
**ASX Clear (Futures) Initial Margin\***  
 Quarterly average

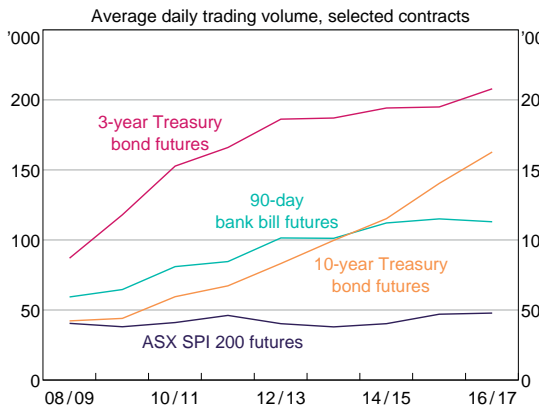


\* Includes margin collected for both exchange-traded derivatives and OTC interest rate derivatives

Source: ASX

futures and the 90-day bank bill swap future – which together accounted for around 96 per cent of the total volume of transactions cleared in 2016/17. The increase in ASX Clear (Futures)’ exposures in recent years is due in large part to strong growth in transactions in the 10-year Treasury bond futures (Graph 9). But it also partly reflects increased margin rates in response to the United Kingdom referendum on European Union membership in June 2016, these rates were gradually reduced towards the end of 2016.

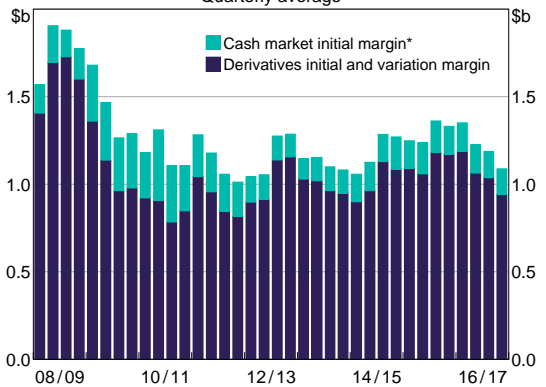
**Graph 9**  
**ASX 24 Derivatives Trades**  
 Average daily trading volume, selected contracts



Sources: ASX; Bloomberg

ASX Clear’s exposures, as measured by margin, declined by 6 per cent in 2016/17 (Graph 10). Trading activity in derivatives on the ASX market has increased slightly, following a number of years of contraction (Graph 11). The bulk of ASX Clear’s exposures relate to these derivatives, primarily due to the longer duration of these contracts relative to the two-day exposures of cash equities trades. The average daily number and value of cash equities trades rose in 2016/17.

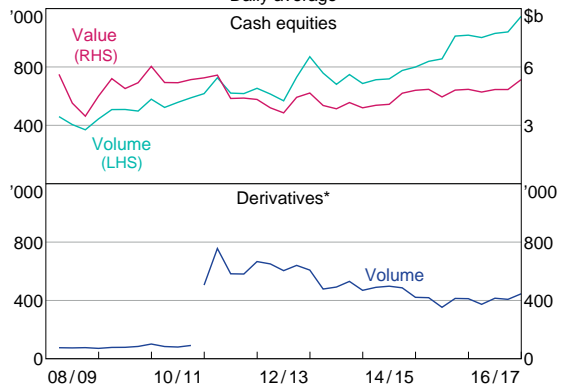
**Graph 10**  
**ASX Clear Margin**  
 Quarterly average



\* Notional amount until 7 June 2013; methodology used to calculate initial margin changed on 18 July 2012

Source: ASX

**Graph 11**  
**ASX Market Trades**  
 Daily average



\* In May 2011, ASX changed its standard contract size for single stock options to 100 shares per contract from 1 000 shares per contract

Source: ASX

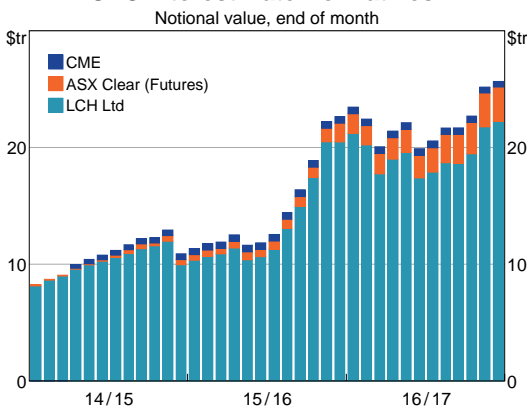
### Over-the-counter interest rate derivatives

OTC IRD are traded directly between counterparties, rather than on an exchange. In recent years the proportion of OTC IRD that are centrally cleared has increased globally. This is in part due to the G20's OTC derivatives reforms, which included the objective of central clearing of standardised OTC derivatives. Consistent with this, mandatory central clearing of OTC IRD (denominated in AUD and major currencies) between internationally active dealers came into effect in Australia in April 2016.

The notional value of centrally cleared AUD-denominated OTC IRD outstanding rose quickly in the first half of 2016 (Graph 12). While this in part reflected the effects of the introduction of mandatory clearing, this increase was also driven by LCH Ltd's introduction of clearing of AUD-denominated overnight index swaps through SwapClear. As at June 2017, 87 per cent of centrally cleared AUD OTC IRD were cleared at LCH Ltd, with most of the remaining share cleared at ASX Clear (Futures).

LCH Ltd and CME provide clearing services for OTC IRD in a range of currencies. AUD-denominated contracts make up a small share of outstanding contracts in all currencies – around 6 per cent at LCH Ltd's SwapClear service and 1 per cent at CME. Australian participation in SwapClear was steady over 2016/17, with five Australian-incorporated entities participating as direct clearing members. CME had no Australian direct clearing participants as at June 2017, though a number of Australian-based banks, superannuation funds and other institutional investors clear products at CME indirectly as clients.

**Graph 12**  
**Outstanding AUD-denominated**  
**OTC Interest Rate Derivatives\***



\* Data count two sides of each trade  
 Sources: ASX; CME Inc.; LCH Ltd