

Payment and Settlement Systems



- 127** Promoting the Stability of Payment and Settlement Systems
- 130** Key Trends and Developments in Retail Payment Systems
- 134** Regional Co-operation in Payment Systems

Payment and Settlement Systems

PROMOTING THE STABILITY OF PAYMENT AND SETTLEMENT SYSTEMS

Oversight of RENTAS

The Real-time Electronic Transfer of Funds and Securities System (RENTAS) is a real-time gross settlement system that facilitates the transfer and settlement of high-value interbank payments and securities transactions. In 2016, RENTAS settled 4.4 million transactions valued at RM51.5 trillion, which was 41.9 times of Malaysia's gross domestic product (GDP). The daily average volume of transactions settled via RENTAS increased marginally to 18,013 transactions, while the daily average value of transactions was lower at RM208.7 billion (2015: 17,900 transactions, RM217.8 billion). The growth in the daily average volume had moderated over the last two years with an average growth of 0.7% per annum compared to an average of 8.7% per annum between 2011 and 2014. This mainly reflected a slower growth in third-party funds transfers via RENTAS (Chart 6.1), following the increasing use of lower cost retail payment systems, such as the

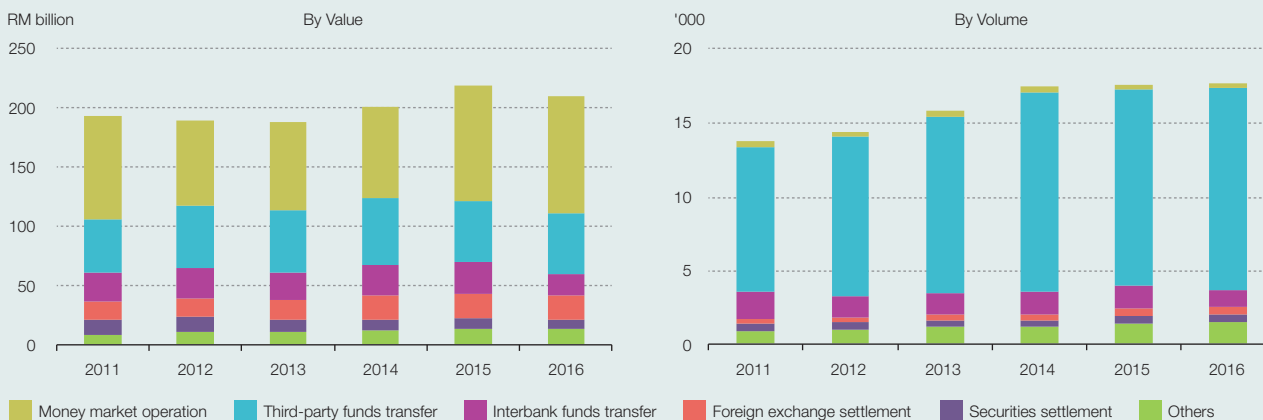
Interbank GIRO (IBG), for lower value transfers. Third-party funds transfers accounted for 77% of the daily average volume of RENTAS transactions.

Throughout the year, RENTAS remained resilient and maintained high system availability of 99.9%. This was achieved amid major planned enhancements to RENTAS undertaken during the year. The Bank has also commenced work to establish a third site to host Mini RENTAS, a smaller scale application of RENTAS, as an added measure to improve resilience against operational disruptions. The third site will serve as a second-level backup facility in the event that both the primary site and the disaster recovery centre are down simultaneously.

The implementation of the New RENTAS on 19 September 2016 completed another important phase in the Bank's continuing efforts to elevate the performance of RENTAS. The industry-wide collaboration project began in 2013 and involved 67 RENTAS participants. Key features introduced in the New RENTAS include: (i) multi-currency settlement functionalities to facilitate foreign currency settlements;

Chart 6.1

RENTAS: Daily Average Transactions



Source: Bank Negara Malaysia

(ii) the adoption of the Society for Worldwide Interbank Financial Telecommunication (SWIFT) messaging standards to improve operational efficiency; and
 (iii) a gridlock resolution mechanism to enable net settlement of pending transactions at specified intervals. Collectively, the enhancements augment the Bank's existing initiatives to improve risk management and cross-border payment services. The enhancements will also facilitate the integration of RENTAS with other regional financial market infrastructures in the future.

The Bank plans to conduct a detailed review of RENTAS in 2017 to affirm its continued compliance with the Principles for Financial Market Infrastructures (PFMI) following the enhancements that have been undertaken. The PFMI represents an international standard of high-level principles against which a country's systemically important payment and settlement system is benchmarked and assessed. RENTAS and its operator, Malaysian Electronic Clearing Corporation Sdn. Bhd. (MyClear) were assessed to have observed all the 19 applicable principles by the International Monetary Fund (IMF) and the World Bank under the Financial Sector Assessment Programme (FSAP) in 2012.

The effective management of cyber risks remains a key focus of the Bank amid the growing global threat of cyberattacks. In June 2016, the Committee on Payments and Market Infrastructures (CPMI) and the International Organisation of Securities Commissions (IOSCO) issued the Guidance on Cyber Resilience for Financial Market Infrastructures, while SWIFT published recommendations in March 2016 on the adoption of IT risk management and security controls to better protect banking infrastructures from being compromised. A comprehensive review of the payment system infrastructures and access channels against these standards was undertaken at the Bank's directive during the year, involving internal reviews by MyClear, Malaysian Electronic Payment System Sdn. Bhd. (MEPS) and their participants. Following the review, the industry has taken steps to further strengthen the current security controls.

Oversight of retail payments

eSPICK and major retail payment systems

The retail payment systems¹ functioned smoothly during the year without any major disruptions to system operations. In 2016, all the retail payment systems, except

¹ The National Electronic Cheque Information Clearing System (eSPICK), Financial Process Exchange (FPX), the National Electronic Bill Payment Scheme (JomPAY), Direct Debit (DD), IBG and Instant Transfer (formerly known as the Interbank Fund Transfer or IBFT).

eSPICK and FPX, achieved system availability above the target level of 99.90%. The eSPICK and FPX achieved system availability of 99.85% and 99.89% respectively.

During the year, several technical configurations were implemented for FPX alongside a technology refresh exercise which was initiated to achieve longer term optimal system performance. Concurrently, a comprehensive review of the operational processes and IT infrastructure of eSPICK is also in progress. Both initiatives are expected to be completed by the end of 2017 and will contribute towards maintaining high system availability of these systems going forward.

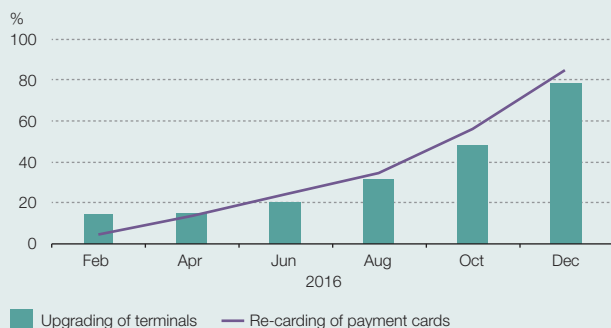
In line with the rapid increase in Instant Transfer transactions over the past four years which grew at an average annual rate of 90.4% in value and 71.9% in volume, further measures were taken to manage interbank credit risks arising from timing differences between the crediting of customers' accounts and interbank settlements. In March 2016, MEPS, the operator of Instant Transfer, introduced an additional settlement window, which significantly reduced the highest daily net debit exposures by 41.9% from RM261.8 million to RM152 million.

Migration to Chip and PIN and Malaysian Chip Card Specification

The industry is making notable progress in the implementation of a two-pronged approach in the enhancements to the payment card infrastructure in Malaysia. This involves: (i) migrating from signature to Personal Identification Number (PIN) verification (Chip and PIN), where cardholders enter a 6-digit PIN for payment card transactions conducted at point-of-sale (POS) terminals; and (ii) the Malaysian Chip Card Specification (MCCS) initiative to enhance the interoperability and efficiency of the domestic brand debit cards using the Europay-MasterCard-Visa (EMV) standard and contactless functionality.

The issuance of PIN-enabled payment cards to replace the existing signature-based payment cards and the upgrading of POS terminals commenced in July 2014 and August 2014 respectively. As at end-2016, 84.7% of payment cards had been replaced and 78.6% of POS terminals had been upgraded (Chart 6.2). The remaining payment cards and POS terminals, including the Outdoor Payment Terminals (OPTs) at self-service petrol stations, are expected to be replaced in the near term. In tandem

Chart 6.2

Progress of Implementation of Chip and PIN


Source: Bank Negara Malaysia

with these initiatives, the Chip and PIN liability shift rules have been implemented for domestic payment card transactions with effect from 1 January 2017. Under the new rules, liability for unauthorised transactions due to lost or stolen payment cards will be borne by issuers that have not replaced their payment cards or acquirers that have not upgraded their POS terminals.

Cardholders are given a six-month transition period starting from 1 January 2017 to familiarise themselves with PIN usage before PIN verification is made mandatory with effect from 1 July 2017. Supporting this transition period is an intensive public awareness and education initiative undertaken by the Bank and the banking industry to encourage the use of PIN prior to 1 July 2017.

Payments fraud

Fraud losses related to payment cards have remained relatively low since the migration to chip-based payment cards in 2005 (Chart 6.3). Total fraud losses declined further in 2016 to account for 0.019% and 0.034% of total transaction volume and value respectively (2015: 0.025%, 0.041%). The most common type of payment card fraud continued to be associated with unauthorised online transactions, accounting for 70% of total fraud cases and 58% of total fraud losses. Almost all (97%) of these losses were borne by entities located abroad which have yet to implement a strong authentication method. This is in line with the rules implemented by the operators of the international payment card networks which require the party with the weaker security measures to bear the losses arising from fraud. This has served to protect Malaysian cardholders due to the strong authentication method implemented in Malaysia since 2012, which requires cardholders to enter a one-time password to authorise any online transaction.

Chart 6.3

Payment Card¹ Fraud Value and Volume, % of Total Transaction Value and Volume

¹ Payment card consists of credit card, debit card and charge card

Source: Bank Negara Malaysia

Following the migration to stronger security measures through PIN-enabled transactions, the Bank in December 2016 revised the requirements dealing with cardholders' liability for unauthorised transactions due to lost and stolen payment cards. Under the revised requirements, cardholders cannot be made liable for unauthorised transactions at POS terminals unless they have acted fraudulently or failed to take reasonable steps² to safeguard their payment cards and PIN, or delayed in notifying their payment card issuers upon discovering the loss or unauthorised use of their payment cards.

Fraud losses related to the use of payment cards and online banking remained low in 2016, at 0.034% of total payment card transaction value and 0.0001% of total online banking transaction value respectively

Online banking fraud cases in Malaysia remained negligible in 2016, amounting to 0.0003% and 0.0001% (2015: 0.0008%, 0.0002%) of total transaction volume

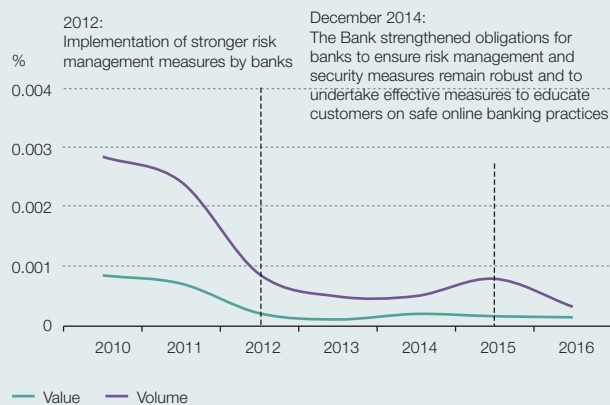
² Cardholders should safeguard their payment cards and PIN and should not:

- disclose the PIN to another person;
- record the PIN on the payment card or on anything kept in proximity with the payment card which could be lost or stolen with the payment card;
- leave the payment card or an item containing the payment card unattended, in places visible and accessible to others; or
- allow another person to use the payment card.

and value respectively (Chart 6.4). In particular, fraud cases for retail transactions maintained a notable downward trend, accounting for 0.0004% and 0.0016% of total retail transaction volume and value respectively (2015: 0.0011%, 0.0022%). Phishing, an act where fraudsters deceive online banking users into disclosing their confidential banking information (e.g. login ID and password) by posing as a regulatory authority or a bank over the phone or e-mail, remained the most prevalent modus operandi. Such cases accounted for 86.1% of total online banking fraud cases reported during the year. The number of cases however declined significantly from 3,089 cases in 2015 to 1,635 cases in 2016, with the Bank and the industry maintaining a heightened focus on educating the public on safe online banking practices.

Chart 6.4

Online Banking Fraud Value and Volume, % of Total Transaction Value and Volume



Source: Bank Negara Malaysia

KEY TRENDS AND DEVELOPMENTS IN RETAIL PAYMENT SYSTEMS

Strategies for achieving the electronic payment (e-payment) targets set out in the Financial Sector Blueprint 2011-2020 continued to focus on enhancing payment infrastructures in order to achieve greater coverage, faster settlements and more efficient payment services. Efforts to displace cheques are mainly centred around promoting the use of credit transfer services, while the key strategy to displace cash is by encouraging the use of debit cards as a convenient alternative to cash (Diagram 6.1). The proliferation of mobile phones and mobile payment solutions also has significant potential to accelerate the migration to e-payments, especially among smaller traders that continue to transact mostly in cash.

The total number of e-payment transactions per capita grew at a higher rate of 18.1% in 2016, compared to the average growth rate of 14.0% over the past five years. During the year, Malaysians on average made 97 e-payment transactions per capita (Table 6.1), compared to 83 in 2015, driven primarily by an increase in credit transfers and payment card transactions. In parallel, the number of Internet banking subscribers recorded a growth of 15.3% to 22.8 million in 2016 (2015: 12.2%, 19.8 million), of which 46.8% were active subscribers (2015: 41.9%) with at least one transaction in a month. Mobile banking subscribers correspondingly grew by 22.9% to 8.9 million (2015: 29.1%, 7.3 million), of which 34.1% were active subscribers (2015: 21.3%).

Greater adoption of credit transfer services, debit cards and mobile payments will accelerate the displacement of cheques and cash

Table 6.1

Progress Made in Achieving the Financial Sector Blueprint Targets

Payment indicators	2011	2016	2020 Target
E-payments per capita	49	97	200
Cheques cleared (million)	205	133	100
Payment card terminals (per 1,000 inhabitants)	7	10	25
Debit card transactions per capita	1	3	30

Source: Bank Negara Malaysia

Increasing momentum in credit transfer transactions to displace cheques

Cheque usage recorded a decline of 10% to 133.1 million in 2016 (2015: -16.5%, 148 million) (Chart 6.5), with the decline observed across all main user categories (Table 6.2). This corresponded with the continued increase in credit transfers which gained further momentum with an annual growth of 31.2% to 256.9 million transactions in 2016 (2015: 39.8%, 195.8 million). The continued growth was partly due to the lower transaction costs and the provision of incentives for credit transfers, following the implementation of the pricing reform measures and the e-Payment Incentive Fund (ePIF) Framework in May 2013 and January 2015

Diagram 6.1

Strategy to Accelerate Migration to e-Payments

Focus area	Displace cheques	Displace cash	
	Credit transfer ¹ (accessible to 99% of CASA ²)	Debit card (43.7 million debit cards in circulation) ³	Mobile payments (43.9 million mobile phone subscriptions) ³
1. Price signal	<ul style="list-style-type: none"> • IBG (maximum fee of 10 sen) • Instant Transfer (maximum fee of 50 sen) 	<ul style="list-style-type: none"> • Ceilings for interchange fee⁴ • Unbundling of Merchant Discount Rate (MDR)⁵ 	<ul style="list-style-type: none"> • Efforts are directed towards promoting open and fair access to shared payment infrastructure, standardisation and interoperability to enhance the mobile payment ecosystem
2. Quality and value proposition	<ul style="list-style-type: none"> • Faster crediting time for IBG • Payment details in bank statement 	<ul style="list-style-type: none"> • Contactless feature 	
3. Access points	<ul style="list-style-type: none"> • Online banking and ATM 	<ul style="list-style-type: none"> • 800,000 POS terminals by 2020 	
4. Market incentive structure	<ul style="list-style-type: none"> • E-Payment Incentive Fund (ePIF)⁶ 	<ul style="list-style-type: none"> • Market Development Fund (MDF)⁷ 	
5. Awareness and confidence	<ul style="list-style-type: none"> • Roadshows and workshops • Media engagements • Strengthening security requirements • Enhancing consumer protection and safeguards 		

¹ Credit transfers comprise IBG and Instant Transfer

² Current and savings accounts

³ Covering a population of 31.7 million individuals in Malaysia

⁴ Interchange fee is a fee payable by an acquirer to an issuer in a payment card transaction. Interchange fee is priced into the MDR charged by an acquirer to a merchant

⁵ MDR is a fee paid by a merchant to an acquirer for facilitating a payment card transaction. Acquirers are required to charge differentiated MDRs that reflect the cost structure of different payment card types

⁶ The ePIF Framework was introduced in 2015 to require banks to channel part of the cheque processing fees collected towards providing incentives for customers to migrate to e-payments

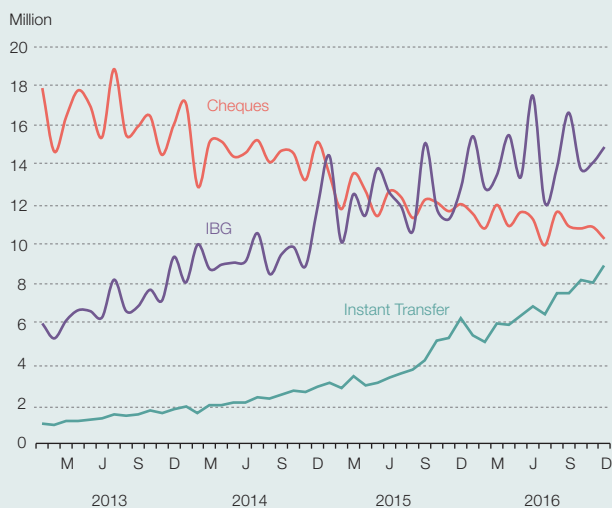
⁷ The MDF was established by two major payment card schemes in 2015, which is expected to channel approximately RM455 million in funds from interchange fees towards expanding the POS terminal network over the period from July 2015 to 2020

Source: Bank Negara Malaysia, Department of Statistics, Malaysia and Malaysian Communication and Multimedia Commission

respectively. While IBG accounted for a larger share of total transaction volume for credit transfers at 67.8%, Instant Transfer has become increasingly popular with an increased share from 23.8% in 2015 to 32.2%

Chart 6.5

Transaction Volume for Cheques, IBG and Instant Transfer



Source: Bank Negara Malaysia

in 2016. This is mainly attributable to the features of Instant Transfer that provide real-time funds transfers and confirmation of beneficiary name prior to executing the transfer.

Instant Transfer has become increasingly popular with an increased share at 32% of total transaction volume for credit transfers in 2016

Table 6.2

Cheque Usage by Main User Categories

Main user categories (Share of total volume in 2016)	Average rate of decline per annum	
	2011-2013	2014-2016
Corporates (46%)	0.6%	9.3%
Individuals (18%)	0.3%	16.9%
Sole proprietorships and partnerships (25%)	1.7%	12.4%
Government agencies (2%)	3.6%	14.5%

Source: Bank Negara Malaysia

Encouraging trend in electronic bill payments

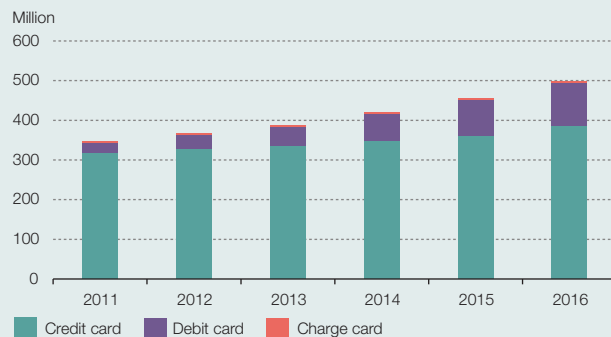
The adoption of electronic channels (e-channels) for bill payments continued to accelerate in 2016, with total bill payment transactions conducted via online banking, mobile banking and Automated Teller Machines (ATMs) increasing by 41.5% to 116 million transactions (2015: 20.0%, 82 million). Notably, bill payment transactions performed via mobile banking grew more than twofold to 11.7 million transactions during the year (2015: 23.8%, 5.1 million), indicating the increasing appeal of mobile banking as a convenient channel for bill payments. The national open electronic bill payment platform, JomPAY, recorded 3.9 million transactions valued at RM2.8 billion in 2016 (2015: 0.3 million, RM0.1 billion). The number of billers registered with JomPAY more than doubled from 472 billers in 2015 to 1,105 billers in 2016, enabling the public to make online payments to more billers from any banking account.

Higher usage of payment cards to displace cash

Payment card³ usage continued to increase in 2016, recording a growth of 9.2% and 6.5% in terms of transaction volume and value respectively, to 495.4 million transactions valued at RM150.8 billion (2015: 453.9 million, RM141.6 billion) (Chart 6.6). Credit cards remained the most widely used payment card, accounting for 77% of the total transaction volume. Of note, the share of debit card transactions has increased in recent years, contributed largely by the expansion in the number of POS terminals facilitated by the lower and more transparent fee structures introduced under the

Chart 6.6

Payment Card Transaction Volume by Card Type



Source: Bank Negara Malaysia

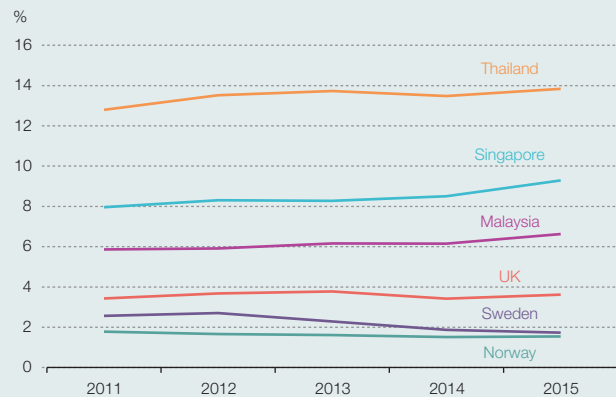
³ Payment cards comprise the debit card, credit card and charge card.

Payment Card Reform Framework (PCRF) which was implemented by the Bank in 2015. The consequent decline in the average Merchant Discount Rates (MDR) for accepting debit cards by as much as 28% for the domestic brand debit card network and 25% for the international brand debit card networks is expected to make debit card acceptance more affordable to merchants and further increase debit card usage going forward. More convenient card payments using contactless cards have also added to higher payment card transactions recorded during the year. This was supported by the continued expansion of contactless POS terminals, which increased almost sevenfold from 4,839 terminals in 2015 to 33,721 in 2016.

Despite the increasing usage of payment cards, cash usage remains relatively high, reflecting the continued prevalent use of cash as a medium of payment in Malaysia (Chart 6.7). The ratio of cash-in-circulation (CIC) to GDP increased steadily, from 5.9% in 2011 to 7.0% in 2016. While the ratio of ATM cash withdrawals to debit card transactions has been on a declining trend since 2011, it remained relatively high at seven ATM cash withdrawals for every one debit card transaction in 2016 (Chart 6.8). This ratio does not take into account cardholders who also use credit cards as a means of payment and settle their outstanding balances in full by the payment due date. In addition to measures noted earlier to encourage wider use of debit cards for payments, the growing awareness and promotions by banks to encourage the usage of debit cards through industry-wide debit card campaigns and nationwide roadshow events are likely to accelerate the displacement of cash.

Chart 6.7

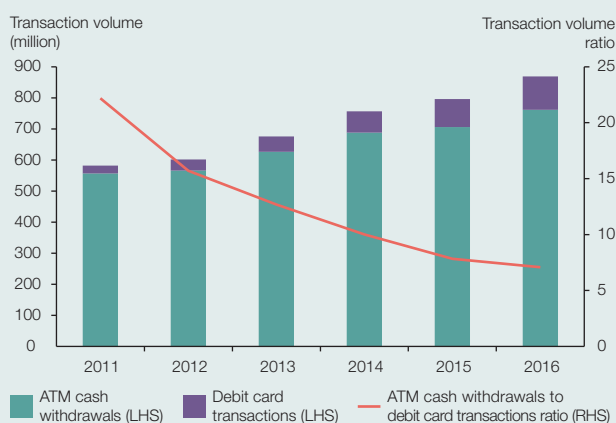
Country Comparison of CIC-to-GDP Ratio



Source: Bank Negara Malaysia, European Central Bank Statistical Data Warehouse, Norges Bank and Bank for International Settlements

Chart 6.8

ATM Cash Withdrawals and Debit Card Transactions



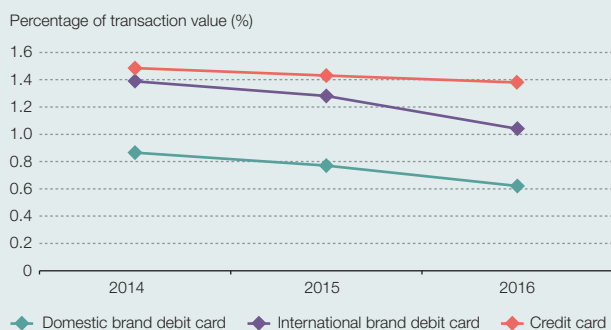
Source: Bank Negara Malaysia

Expansion of payment card acceptance points

The introduction of interchange fee ceilings and improved transparency in the payment card acceptance costs to merchants under the PCRf have resulted in a continued decline of the average MDR for debit and credit cards (Chart 6.9). Under the PCRf, the merchants are also empowered to route their debit card transactions via their preferred debit card network. This has led to an increase in competition among debit card networks. As a result, major international brand debit card networks lowered their scheme fees during the year, which in turn resulted in the lowering of the MDR charged to merchants. Combined cost savings to merchants from lower MDR for debit and credit cards were estimated at RM168 million in 2016. The lower MDR coupled with the establishment of the

Chart 6.9

Average MDR by Type of Payment Card Transactions



Source: Bank Negara Malaysia

Market Development Fund (MDF) in 2015 have spurred the expansion of POS terminals, which grew at a double digit rate of 19.6% in 2015 and 17.5% in 2016 (2011-2014: average of 6.5% per annum). In 2016, the number of POS terminals increased to 323,033 terminals or 10 terminals per 1,000 inhabitants (2015: 274,986 terminals, 9 terminals per 1,000 inhabitants).

Fostering an enabling environment for mobile payments

Mobile payments have significant potential to reduce the use of cash, with 43.9 million mobile phone subscriptions covering a population of 31.7 million individuals in Malaysia. It also complements initiatives to promote financial inclusion. The growth in financial transactions conducted via the mobile banking channel increased almost threefold from 35.6% in 2015 to 98.0% in 2016, representing 62.6 million transactions valued at RM33 billion (2015: 31.6 million transactions, RM20.6 billion).

The Bank will continue to foster an enabling environment for the wider adoption of mobile payments. This includes promoting interoperability through shared and open infrastructures to expand the payment network reach, lower payment costs and encourage innovation of value-added services. One of the main strategic priorities of the Bank in 2017 is to foster collaboration and interoperability among different mobile payment schemes leveraging on a common infrastructure for switching, clearing and settlement. This will be augmented by efforts to develop a central addressing database to facilitate payments to be made more convenient using common identifiers such as mobile numbers and National Registration Identity Card (NRIC) numbers. To promote a level playing field in the payment ecosystem, the Bank will facilitate open and fair access to shared payment infrastructures by banks and non-bank payment service providers, with proportionate regulation. This is expected to create a more vibrant and innovative payment landscape that fosters continuous improvements in payment services to keep pace with emerging technological changes and shifting user demands.

Fostering awareness and confidence in e-payments

The Bank continues to work closely with the banking industry to increase awareness and promote confidence among consumers and businesses in using cost-effective e-payment services.

During the year, the National e-Payment Roadshow (Roadshow) events were held in 20 towns across nine states in collaboration with the banking associations and the National Cards Group. The Roadshow, which was attended mainly by small and medium enterprises (SMEs) and micro-enterprises, served as a platform to promote the use of payment cards, electronic funds transfers and online banking services, as well as to educate the participants on safe practices in performing e-payment transactions. Selected bank branches also offered various incentives under township campaigns that were held in conjunction with the Roadshow, such as lower MDR and free rental for POS terminals to businesses that signed up for acceptance of payment cards.

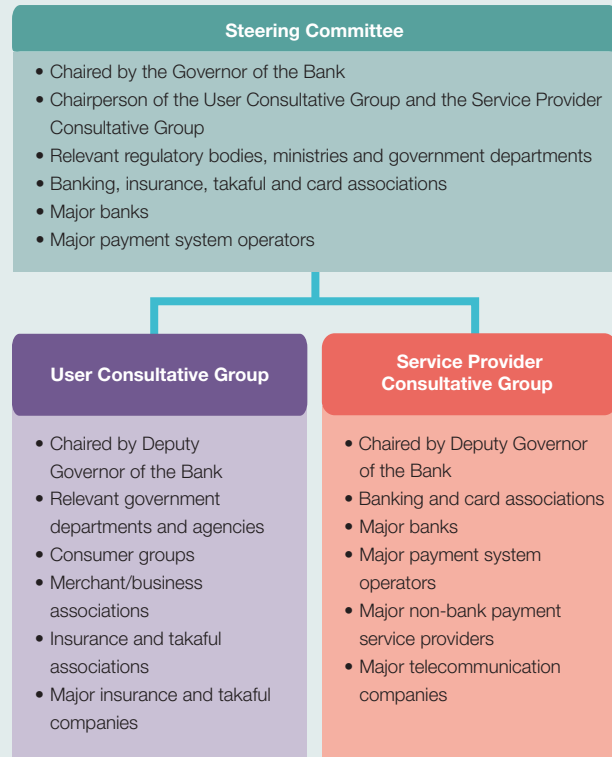
Transformation of the National Payments Advisory Council

The Bank established the National Payments Advisory Council (NPAC) in 2001 as a reference and advisory body to provide market inputs on matters relating to the payment systems in Malaysia. The NPAC is chaired by the Governor of the Bank and its members comprise senior representatives from selected regulatory bodies, ministries and government departments, banking, insurance, takaful and card associations, major banks and major payment system operators in Malaysia.

In anticipation of the rapidly changing payment landscape and the need to future-proof the payment infrastructures, changes were introduced during the year to enhance the structure and functioning of the NPAC as a strategy setting and industry coordination body (Diagram 6.2). Two Consultative Groups, namely the User Consultative Group (UCG) and the Service Provider Consultative Group (SPCG), representing both the demand and supply sides of the payment ecosystem respectively, were established. The UCG and SPCG provide a structured and more inclusive platform to solicit feedback and proposals from both the end-users and the payment service providers to enhance the payment systems. These inputs form the basis of recommendations and resolutions proposed to the Steering Committee of the NPAC on strategic and tactical priorities for the development of Malaysia's payment landscape.

Diagram 6.2

Composition of the Transformed NPAC



Source: Bank Negara Malaysia

REGIONAL CO-OPERATION IN PAYMENT SYSTEMS

In April 2016, the Association of Southeast Asian Nations (ASEAN) Finance Ministers and Central Bank Governors endorsed a Strategic Action Plan (SAP) for ASEAN Financial Integration 2025. The SAP covers a 10-year framework that builds on the existing ASEAN Economic Community (AEC) Blueprint. The Bank, through the ASEAN Working Committee on Payment and Settlement Systems (WCPSS), will contribute to and support the initiatives identified under the SAP to foster an ASEAN payment system that is safe, innovative, competitive, efficient and cost-effective. The Bank is also a member of the study group established during the year under the Working Group on Payment and Settlement Systems (WGPSS) of the Executives' Meeting of East Asia-Pacific Central Banks (EMEAP) to examine the impact of financial technology (FinTech) on payment and settlement systems, including its implications for its member central banks.