

THE FUTURE OF CASH

An Asian Perspective
2017

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Asia is the continent of records. With 50 countries, it covers 30% of the world's land area and gathers 56% of the global population. Moreover, it has the largest GDP of all continents measured in terms of Purchasing Power Parity.

Asia has also been the growth engine for the world economy, for several decades. Between the 1960s and 1990s, the Asian Tigers - Taiwan, South Korea, Singapore and Hong Kong - evolved from low-income to advanced economies and maintained growth rates in excess of 7% per annum over the 30-year period¹. At the turn of the century, the so-called BRIC countries - Brazil, Russia, India and China - represented 8% of global GDP; by 2010, this share had increased to 25%. In 2011, Citigroup², identified 11 Global Growth Generators, i.e. countries which are the likely future sources of global economic growth between 2010 and 2050; nine of the eleven countries are in Asia³.

Asia is the birthplace of coins and notes. The first coins are believed to have surfaced in the ancient Kingdom of Lydia, in present day Turkey around 630 BC. The Song Dynasty which reigned in China from AD 960 to 1279 is often credited as the first to introduce a paper-based banknote.

This research is based on the analysis of six countries: Hong Kong, Indonesia, South Korea, Philippines, Thailand and Singapore. This group of countries is not representative of Asia in any way, but reflects the extraordinary diversity of the continent. This is true in terms of economic development, of cultural diversity, of the maturity of payment infrastructure but also with regard to the actual organisation of the cash cycle.

The issuing and circulation of banknotes and coins throughout the economy represents a complex ecosystem, involving numerous stakeholders: Central Banks, financial institutions, retailers as well as businesses and citizens. Given the sheer size of the continent, but also specific characteristics including harsh weather conditions, frequent natural events such as hurricanes, volcano eruptions or tsunamis, the smooth circulation of cash presents unique challenges.

The objective of this study is to improve our understanding of how cash is used in Asia and fuel the discussion on how to improve the smooth and efficient circulation of cash. We also hope to facilitate the exchange of best practices across countries. Given the importance of Asia, in economic and demographic terms, the evolution of cash in Asia could well have an impact in other continents.

1: <http://marketbusinessnews.com/financial-glossary/economic-tigers/>

2: <http://willembuiters.com/3Glite.pdf>

3: The nine Asian Global Growth Generators are Bangladesh, China, India, Indonesia, Iraq, Mongolia, Philippines, Sri Lanka and Vietnam.

ACKNOWLEDGEMENTS

We would like to extend our warm gratitude to the organisations and individuals who have made this research possible.

The Central Banks or monetary authorities of the six countries covered in this report have taken the time to meet and have openly shared information and insight with us:

- Hong Kong Monetary Authority
- Bangko Sentral Ng Pilipinas
- Bank Indonesia
- Bank of South Korea
- Bank of Thailand
- Monetary Authority of Singapore

The three sponsor companies have provided support, resources and industry expertise:

- Arjowiggins Security
- KBA-NotaSys
- SICPA

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- Fernand Garcia de Cruz, representing Arjowiggins Security
- Cédric Savioz, representing Sicpa
- Gerben Van Wijk, representing KBA-NotaSys

ABOUT US



KBA-NotaSys

www.kba-notasys.com

KBA-NotaSys is regarded as the main driver of innovation and excellence within the high-security printing industry. Working hand in hand with our clients and partners, we have continuously elevated the art of banknote printing to new levels. By listening to our clients' needs, we have expanded our range of products and services to meet the ever-changing challenges of our market.

Today we offer a unique range of products and services to authorised security printers and central banks enabling them to design, produce and issue banknotes according to their specific and individual needs.



Sicpa

www.sicpa.com

SICPA is a leading global provider of secured authentication, identification and traceability solutions and services. Founded in 1927 and headquartered in Lausanne, Switzerland, SICPA is a long-trusted advisor to governments, central banks, high-security printers, and industry. With high-technology security inks at the core of its expertise, the company protects the majority of the world's banknotes, security and value documents from the threats of counterfeiting and fraud. SICPA also integrates ink-based covert features and sophisticated traceability technologies to offer solutions and services to governments and industry, ensuring product authentication, traceability and protection as well as tax reconciliation. Operating on five continents, SICPA is a global company providing technologies and services to most nations worldwide.



Arjowiggins Security

www.security.arjowiggins.com

A leading player in the banknote industry, Arjowiggins Security has been producing currency paper for more than two centuries.

It is the trusted partner of over 140 countries in banknote manufacturing.

Arjowiggins Security places a premium on technological innovation to continue to offer its customers state-of-the-art paper and security features, in order to help them address the ever-changing issues in the banknote market in terms of security, quality and durability.

The company draws on the expertise of a dedicated research center and the know-how of an industrial team to provide central banks and high security printers with the latest in banknote paper and security features.



AGIS Consulting

www.agis-consulting.com

AGIS Consulting is an independent strategy consulting firm, specialised in retail payments, including cash, cards and other payment instruments. AGIS was founded in 2001 in Paris and has since developed a worldwide network of partners.

The global retail payments market is facing tremendous change, under the combined pressures of the evolving regulatory market and financial integration, technological innovation and socio-economic factors. AGIS aims at providing its clients with out-of-the box thinking, in order to anticipate the changes in the market and develop customised value-added solutions.

Clients range from financial institutions, to payment service providers, to soft and hardware vendors.

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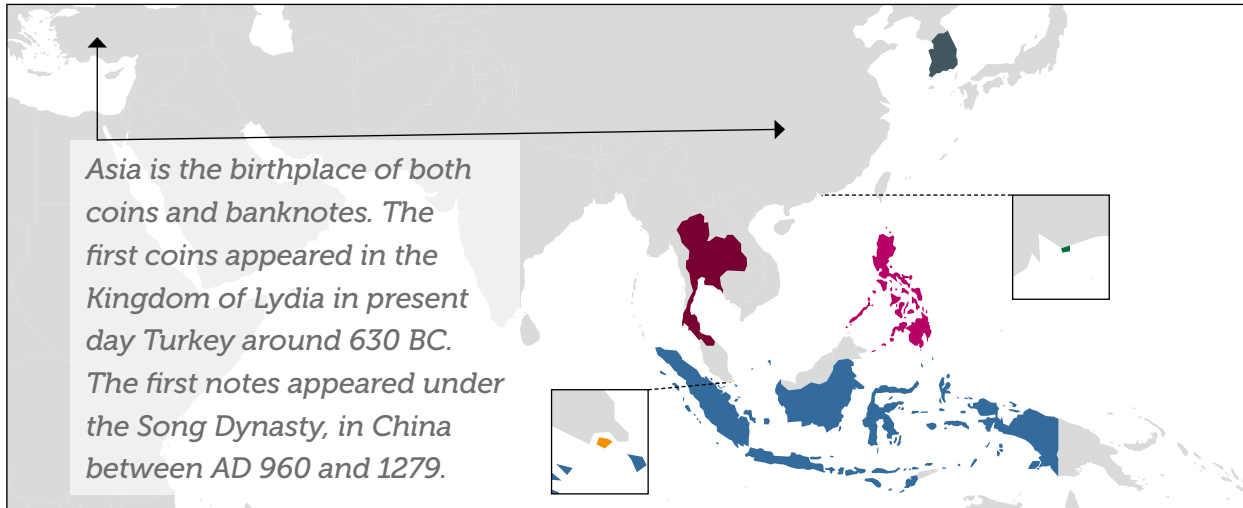


1

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

ASIA IS THE CONTINENT OF RECORDS



■ **SINGAPORE** has the world's highest denomination, the SGD 10,000. It is no longer issued since 2015 but remains legal tender.

■ **HONG KONG** has the highest number of banknotes per person.

■ **SOUTH KOREA** has the world's highest ATM density.

■ **THE PHILIPPINES** have a unique substrate which includes abaca, a local plant.

■ **INDONESIA** is home to the largest banknote printing factory.

OVER THREE QUARTERS OF THE WORLD'S BANKNOTES CIRCULATE IN ASIA

2015	Hong Kong	Indonesia	South Korea	Philippines	Singapore	Thailand
Population (millions)	7.3	257.6	50.6	100.7	5.5	65.7
GDP (current USD billions)	310	862	1,378	292	293	395
GDP per inhabitant (USD)	42,423	3,347	27,222	2,899	52,889	5,815
GDP (LCU Millions)	2,402,506	11,540,789	1,558,591,500	13,285,240	402,458	13,357,485
Cash in Circulation (LCU Millions)	371,826	586,800	84,348,469	929,239 ²	37,212	1,599,736
CIC/GDP %	15.5	5.1	5.4	7	9.2	12
Number of banknotes (millions)	2,346	16,300	4,759	3,392 ²	1,047 ³	5,166
Number of banknotes/person	321	63	94	34	190	79
ATMs Per 100,000 inhabitants	49.8 ¹	49.6 ²	290.7 ³	23.7 ²	59.3 ²	111.9 ²

Source: (1) 2011; (2) 2014; (3) 2013; World Bank, BIS, Central Banks

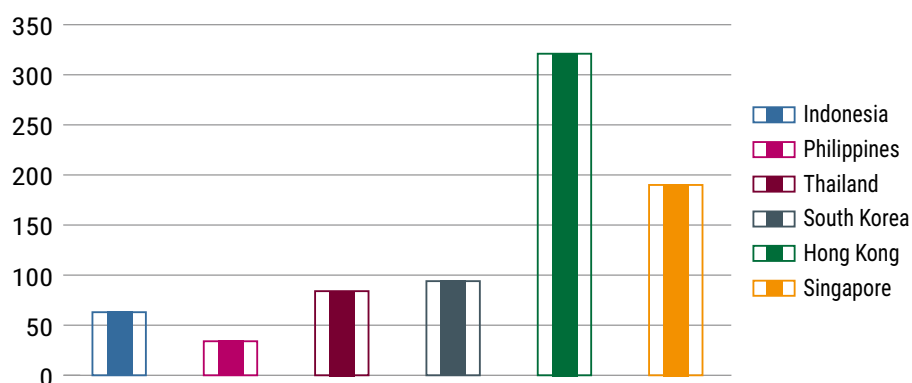
ASIA IS CASH INTENSIVE

The Asian payments market is at the forefront of innovation. Success stories include UnionPay in China, the leading global card scheme, Octopus, the transit and

payment card in Hong Kong, or SamsungPay, which is available in South Korea and Singapore.

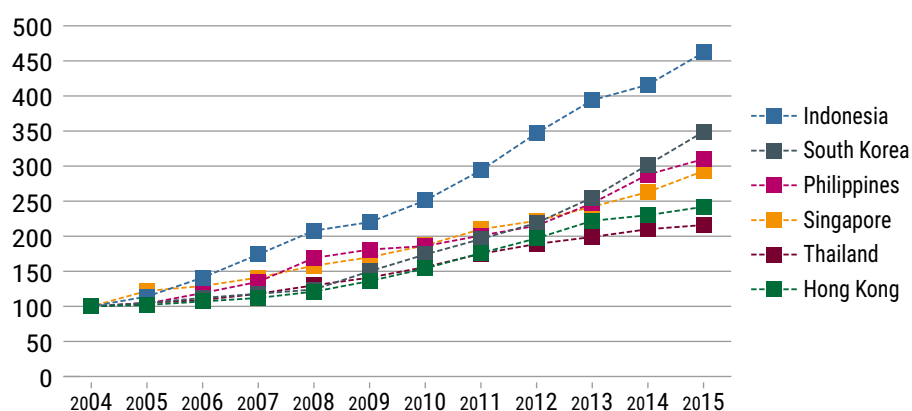
Number of notes per person

There are more notes in the mature economies than in emerging ones.



Evolution of Value of Cash (notes and coins) in Circulation 2006 = 100

Cash is growing steadily in value in all markets



Demand for cash is driven by:

- Economic growth
- Growth of GDP per capita
- In the mature economies, cash is increasingly used as a store of value, since the Global Financial Crisis

Festive and seasonal demand also play an important role; “red envelopes” during the Chinese New Year, increased activity and donations during the Ramadan and Eid Mubarak as well as Christmas and New Year shopping are all key drivers.

Beyond payments, cash also plays a critical role in three areas. It plays an essential contingency role in case of natural disasters or financial crises. It is also a critical element of financial inclusion. In emerging markets, cash remittances are a key component of the economy.

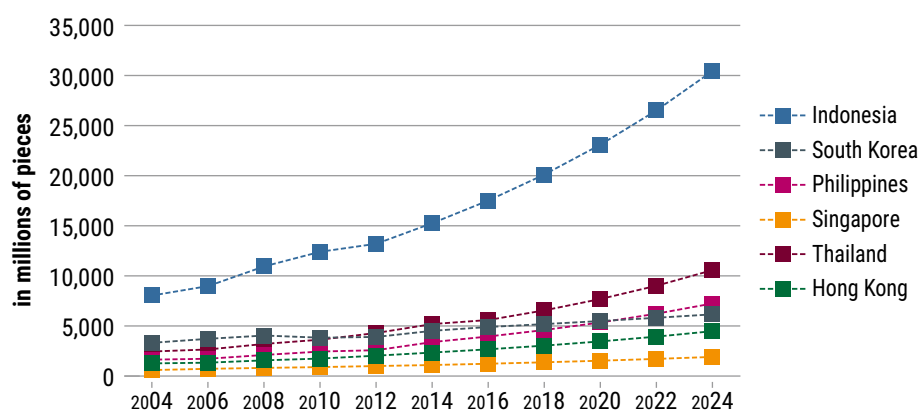
EXECUTIVE SUMMARY

INNOVATION CONTRIBUTES TO MAKING THE CASH CYCLE MORE EFFICIENT

Asia encompasses a wide range of central bank models. In Hong Kong, the issuing of banknotes has been delegated to three commercial banks. In the five other markets, the central banks are more involved in the cash cycle.

Innovation has widely contributed to the availability and efficiency of cash. In Indonesia, the central bank operates mobile cashier services in remote areas. In the Philippines, commercial banks have designed mobile ATMs, often deployed after natural disasters. Hong Kong and South Korea have initiated coin collection campaigns to increase the velocity of coins.

Projections of Future Banknote Volumes based on historic growth rates



In the three emerging countries, financial inclusion programmes have played a key role in achieving inclusive growth and sustainable economic and social development. Measures to combat financial exclusion

often include innovations such as e-banking, branchless banking, agency banking, microfinance and e-money. They contribute nonetheless to make cash more readily available.

Share of population holding an account at a financial institution (% age 15+)

	2011	2014
Indonesia	19.6	35.9
Philippines	26.6	28.1
Thailand	72.7	78.1





2

COUNTRY PRESENTATIONS



COUNTRY PRESENTATIONS

2.1. HONG KONG

2.1.1. Overview

Population (millions) (2015)	7.3
GDP (in USD billions) (2015)	310
Banknotes in circulation (in million pieces, 2015)	2,346
Number of banknotes/person	321
Account at a financial institution (% age 15+) 2014	96.1
Debit card (% age 15+) 2014	70
ATMs per 100,000 adults 2011	49.8
Commercial bank branches per 100,000 adults 2014	22.7

Source: World Bank, Global Findex Database, Hong Kong Monetary Authority

Hong Kong's economy is dominated by the service sector, which accounts for over 90% of its GDP, while industry constitutes 9%.

Hong Kong became a special administrative region of the People's Republic of China on 1 July 1997. The Hong Kong Special Administrative Region (HKSAR) enjoys a high degree of autonomy in accordance with the principle of "one country, two systems" and the Basic Law, which prescribes the systems to be practised in the HKSAR. The HKSAR exercises executive, legislative and independent judicial power, including that of final adjudication. It also operates an independent monetary system.

Hong Kong is one of the most significant global financial centres. It ranks within the top 10 countries in terms of GDP per capita, measured by Purchasing Power Parity and the 44th largest economy (in terms of Purchasing-Power Parity). It has a very high Human Development Index ranking and, in 2016, replaced Japan as the country with the longest life expectancy; it suffers however, from severe income inequality.

Hong Kong is a major centre for international finance and trade, with one of the greatest concentrations of corporate headquarters in the Asia-Pacific region. It is known as one of the Four Asian Tigers for its high growth rates and rapid development from the 1960s to the 1990s. Between 1961 and 1997, the gross domestic product grew 180 times while per capita income GDP increased 87 times over.

The Stock Exchange of Hong Kong is the sixth largest in the world and has a market capitalisation of USD3.3 trillion as of June 2016.⁴ It is the leading centre for initial public offerings (IPO). Hong Kong matured to become a financial centre in the 1990s, but was greatly affected by the Asian financial crisis in 1998, and again in 2003 by the SARS outbreak. A revival of external and domestic demand has led to a strong recovery, as cost decreases have strengthened the competitiveness of Hong Kong exports and a long deflationary period has ended.

Hong Kong's economy is dominated by the service sector, which accounts for over 90% of its GDP, while industry constitutes 9%. Inflation was at 2.5% in 2007. The largest export markets are mainland China, the United States, and Japan. Hong Kong is ranked fourth in terms of the highest percentage of millionaire households, behind Switzerland, Qatar, and Singapore with 8.5% of all households owning at least one million US dollars. Hong Kong is also ranked second in the world by the most billionaires per capita (one per 132,075 people), behind Monaco.

4: http://www.hkexgroup.com/About-HKEX/Company-Information/About-HKEX?sc_lang=en

In 2014, Hong Kong was the eleventh most popular destination for international tourists among countries and territories worldwide, with a total of 27.8 million visitors contributing a total of US\$38,376 million in international tourism receipts.

THE HONG KONG MONETARY AUTHORITY

The Hong Kong Monetary Authority (HKMA) was established on 1 April 1993 by merging the Office of the Exchange Fund with the Office of the Commissioner of Banking. Its main functions and responsibilities are governed by the Exchange Fund Ordinance and the Banking Ordinance and it reports to the Financial Secretary.

The HKMA is the government authority responsible for maintaining monetary and banking stability. Its main functions are:

- Maintaining currency stability within the framework of the Linked Exchange Rate system
- Promoting the stability and integrity of the financial system, including the banking system

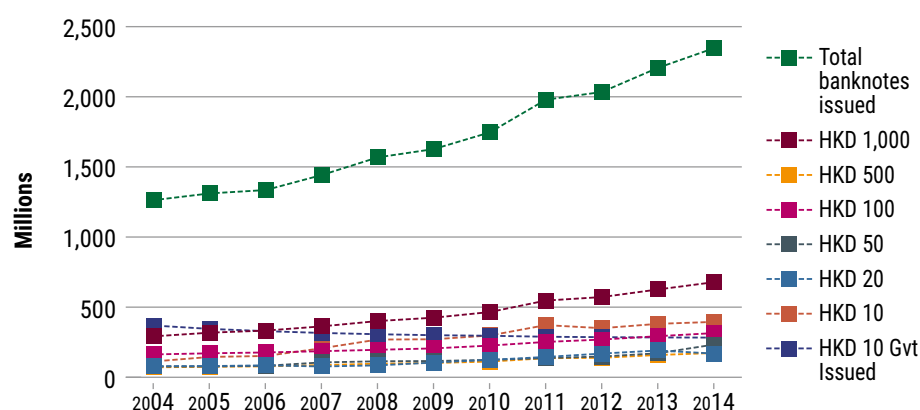
- Helping to maintain Hong Kong's status as an international financial centre, including the maintenance and development of Hong Kong's financial infrastructure
- Managing the Exchange Fund.

The HKMA is responsible for achieving the monetary policy objective in Hong Kong set by the Financial Secretary, including determining the strategy, instruments and operational means for doing so, and for maintaining the stability and integrity of the monetary system of Hong Kong.

The monetary policy objective is currency stability, defined as a stable external exchange value of the currency of Hong Kong, in terms of its exchange rate in the foreign exchange market against the US dollar, at around HK\$7.80 to US\$1. The structure of the monetary system is characterised by Currency Board arrangements, requiring the Hong Kong dollar Monetary Base to be at least 100 per cent backed by US dollar reserves held in the Exchange Fund at the fixed exchange rate of HK\$7.80 to US\$1.

2.1.2. Banknotes and Coins

Volume of Banknotes in Circulation



Hong Kong dollar notes in circulation are \$10, \$20, \$50, \$100, \$500 and \$1,000. The \$20, \$50, \$100, \$500 and \$1,000 notes are issued by the three note-issuing banks. The \$10 dollar note is issued by the Government since 2002 in recognition of a continuing demand among the public for a note in addition to the coin; the \$10 notes issued by two note-issuing banks in the 1990s remain legal tender, but are no longer printed. In 2007, a \$10 polymer note was introduced to assess the performance and acceptability of polymer notes in Hong Kong.

At the end of 2015, the total value of banknotes in circulation was HK\$360.2 billion, an increase of 5.3% from a year earlier. The total value of government-issued notes and coins in circulation amounted to HK\$11.2 billion, up 2.9%. The value of government-issued HK\$10 notes in circulation was HK\$4.0 billion, of which 85% were polymer notes.

COUNTRY PRESENTATIONS

In 2015, the HKMA announced a plan to launch a new series of banknotes. While the latest series, which was launched in 2010, remains robust, it is important to update the banknotes with the latest security features to stay ahead of counterfeiters.

The Hong Kong dollar was the thirteenth most traded currency in the world in 2013⁵. Growing economic integration between China and Hong Kong continued to drive the international demand for Hong Kong-dollar cash while the appreciation of the renminbi in recent years tended to restrain it. Meanwhile, gaming activities in Macao provided an extra boost in external cash demand in recent years. According to a HKMA research paper⁶, around 50 – 70% of Hong Kong-dollar currency held by the public, or roughly \$100 – 140 billion, was due to external demand at the end of 2009, mostly in the form of high-denomination notes.

2.1.3. The Cash Cycle

The Hong Kong cash cycle is quite unique due to the important role played by the issuing banks. These are three commercial banks, namely The Hong Kong and Shanghai Banking Corporation (HSBC), Standard Chartered Bank (Hong Kong) Limited and Bank of China (Hong Kong) Limited which have been authorised to issue banknotes by the Government. The issuance is guaranteed by a deposit within the Exchange Fund of an equivalent amount of US dollars.

The issuing banks are responsible for the design, the distribution, processing and destruction of the notes. They operate their own cash centres. The transportation and logistics are carried out by three cash-in-transit companies.

The role of the HKMA is limited to policy and a high-level oversight of the issuing banks currency operations. The HKMA has introduced a clean note policy and their banknotes are printed on durable paper. As a result, the quality of circulation is good. Also, the counterfeit rate is very low, at about 1 piece per million.

2.2. INDONESIA

2.2.1. Overview

Population (millions) (2015)	257.6
GDP (in USD billions) (2015)	862
Banknotes in circulation (in million pieces, 2015)	16,300
Number of banknotes/person	63
Account at a financial institution (% age 15+) 2014	36
Debit card (% age 15+) 2014	25.9
ATMs per 100,000 adults 2015	53.31
Commercial bank branches per 100,000 adults (2015)	17.8

Source: World Bank, Global Findex Database, Bank Indonesia

The extraordinary geographic diversity, with over 17,000 islands combined with the mass population pose natural obstacles to financial inclusion.

5: <http://www.bis.org/publ/rpfx13fx.pdf>

6: Analysing External Demand for the Hong Kong-Dollar Currency, Frank Leung, Philip Ng and Simon Chan; Hong Kong Monetary Authority Working Paper 07/2010 http://www.hkma.gov.hk/media/eng/publication-and-research/research/working-papers/hkmawp10_07_full.pdf

Indonesia is the largest economy in Southeast Asia and has enjoyed impressive economic growth since overcoming the Asian financial crisis of the late 1990s. The country's gross national income per capita has steadily risen, from \$560 in 2000 to \$3,630 in 2014. Today, Indonesia is the world's fourth country by population, the world's 10th largest economy in terms of purchasing power parity, and a member of the G-20. It has made enormous gains in poverty reduction, cutting the poverty rate to more than half since 1999, to 11.2% in 2015.

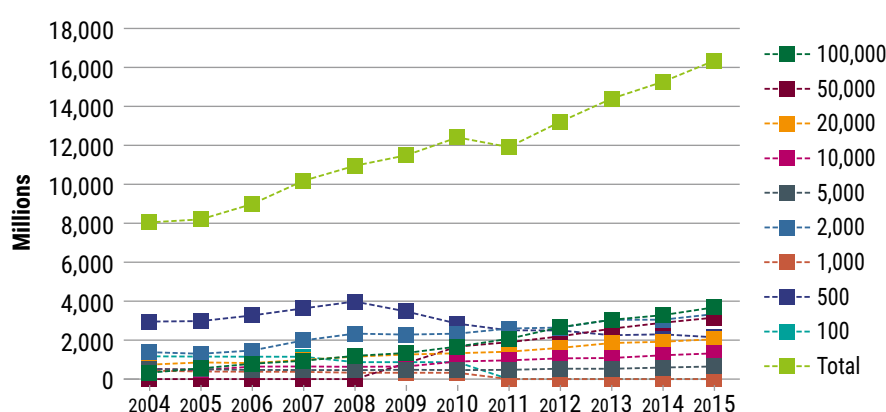
According to the World Bank, due to weaker demand for commodities – the fuel for Indonesia's economic boom in the past decade – Indonesia's GDP growth has been slowing since 2012. The rate of growth in fixed investment, exports, and consumption, has slowed – and these developments have impacted poverty reduction. Poverty declined by 1% annually from 2007 to 2011, but has fallen by an average of only 0.3 percentage points per year since 2012. Out of a population of 252 million, 28.6 million Indonesians still live below the poverty line and approximately 40% of all people remain clustered around the national poverty line set at IDR 330,776 per person per month (\$22.60).

The investment climate, though generally positive, faces continued regulatory uncertainties and high logistics costs. However, a series of reform packages shows that the government aims at convincing investors that Indonesia is open for business. The packages include a reduction of the Negative Investment List, a list of some 600 sectors that represent about 70% of the economy. The government has pledged further reforms.

The extraordinary geographic diversity, with over 17,000 islands combined with the mass population pose natural obstacles to financial inclusion. The remote location of small islands and the limited banking potential of their inhabitants discourage banks from reaching out and providing financial services. Indonesia has adopted financial inclusion as an essential pillar of the national strategy for reducing the rising income disparity between rural and urban areas.

2.2.2. Banknotes and Coins

Volume of Banknotes in Circulation



In value, cash in circulation has grown at the Compound Annual Growth Rate of 15% over the period 2005-2015. This is the highest rate of all the countries covered in this report.

The ratio of cash on circulation to GDP has remained stable over the 10-year period at 5-6%.

The number of banknotes has reached 16.97 billion pieces in 2016. This represents a CAGR of 6.6% between 2004 and 2014.

There are seven note denominations of 1,000; 2,000; 5,000; 10,000; 20,000; 50,000 and 100,000 Rupiah.

COUNTRY PRESENTATIONS

There are six coins of 50; 100; 200; 500 and 1,000 Rupiah. The revocation of the 100 and 200 notes as well as the introduction of a 2,000 note led to a temporary decline in volume in 2011. As of December 2016, the 100,000 note represents over 63% of the value of notes in circulation. Bank Indonesia has been considering a redenomination but this has proved difficult as it requires a decision of Parliament.

Bank Indonesia launched a new series on 19 December 2016, with seven notes and four coins, honouring 12 national heroes of the state. The old series of coins and banknotes will remain legal tender after the new series has entered circulation.

The banknotes are printed by the state-owned company, Peruri, which is the only company trusted by the State to print Rupiah banknotes and mint coins as mandated by Indonesian Currency law number 7 of 2011. The Company was established on the 15th of September 1971 as a merger of two State Companies, namely PN Pertjetakan Kebajoran and PN ArthaYasa. In accordance with the national Intelligence Agency and the Ministry of Industry, Peruri is defined as a corporation of strategic importance. The company is engaged in the production of notes, the minting of coins and the printing of security and identity

documents. In 2015, Peruri printed 9.3 billion notes and minted 1.6 billion coins. The company operates a single facility located on the island of Java, making it the world's largest banknote printworks.

2.2.3. The Cash Cycle

Bank Indonesia became an independent central bank in 1999 and operates today as a fully autonomous institution. The general cash management policy of the central bank is aimed at reaching three pillars:

- Providing currency in sufficient quantities, in the desired denominations, of high quality
- Improving the secure and optimal distribution throughout the entire country
- Ensuring high quality of cash services

Bank Indonesia carries out six stages of rupiah currency management. These stages are planning, printing, issuing, circulating, revoking and withdrawing, as well as destroying. Bank Indonesia is the institution authorised to issue, circulate, as well as revoke and withdraw notes. Meanwhile, the planning, printing, and destruction are carried out by Bank Indonesia in coordination with the Government.

The Indonesian Cash Cycle



The distribution of cash represents a huge challenge in Indonesia, a diverse archipelago with over 17,000 islands, 300 ethnic groups, some incredibly rough terrain and radical weather conditions.

Bank Indonesia is currently redesigning the architecture of its currency circulation network. The project is entitled Centralised Cash Network Planning, where the planning and command will be held in Bank Indonesia's head office under the Department of Currency Management. The project envisions 152 cash points throughout Indonesia in 2017, including 107 cash custodies operated by commercial banks and 45 cash operation offices at Bank Indonesia branches. Currently, Bank Indonesia has 70 cash custodies and expects to reach 107 by the end of 2017. Bank Indonesia has a network of 42 branches throughout Indonesia that operate as cash centers and the number will grow to 45. In the meantime, Bank Indonesia will also build two modern Cash Centres, one to serve the west of Indonesia and the other one is to serve the east. These cash centres will service all the banks and the 152 cash points.

Bank Indonesia has implemented a clean note policy and has defined standards for the recirculation of banknotes. The sorting is essentially automated. The central bank

supervises the process with on-site inspections and imposes penalties to banks, which do not comply with the policy. Bank Indonesia is contemplating implementing a balance sheet relief mechanism to provide compensation to commercial banks, which are increasingly involved in the processing of notes.

The central bank owns a fleet of trucks, though transportation is also outsourced, using a wide variety of methods: sea, train, road. Currently, Bank Indonesia cooperates with other institutions such as the army, the navy, the railroad company, the police, and the Ministry of Transportation. The strategy is to delegate the transportation to third parties, such as banks and cash-in-transit. There are 30 cash-in-transit companies, which are licensed and supervised by Bank Indonesia.

There are over 100,000 ATMs, which represents a density of approximately 50 for 100,000 adults. There has been a sharp rise in ATM installations. However, the interoperability is still limited as banks can choose between three switches. Bank Indonesia is pushing for a National Payment Gateway. In remote areas, ATMs are not profitable, but branchless banking is developing gradually.

2.3. SOUTH KOREA

2.3.1. Overview

Population (millions) (2015)	50.6
GDP (in USD billions) (2015)	1,378
Banknotes in circulation (in million pieces)	4,759
Number of banknotes/person	94
Account at a financial institution (% age 15+) 2014	94
Debit card (% age 15+) 2011	67
ATMs per 100,000 adults 2015	282
Commercial bank branches per 100,000 adults 2011	18

Source: World Bank, Global Findex Database, Bank of South Korea

Along with Hong Kong, Singapore and Taiwan, South Korea, was one of the four Asian Tigers, which underwent rapid industrialisation and strong growth between the 1960s and 1990s.

COUNTRY PRESENTATIONS

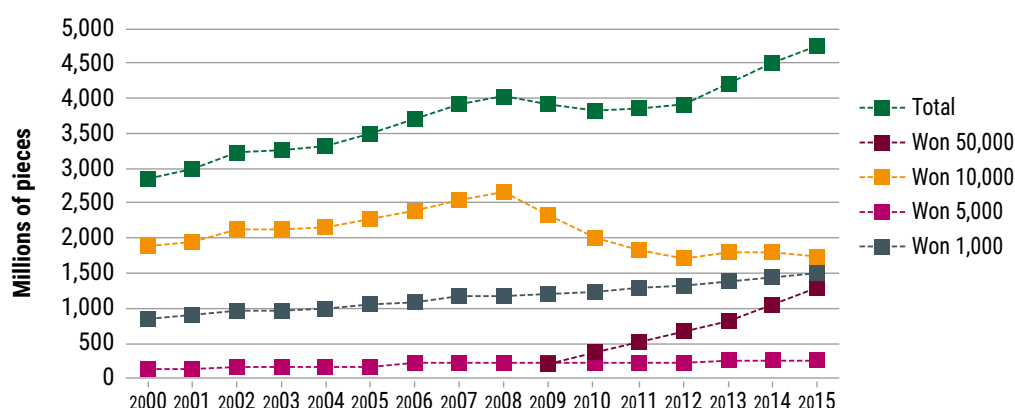
South Korea has experienced remarkable success in combining rapid economic growth with significant reduction in poverty. Along with Hong Kong, Singapore and Taiwan, South Korea, was one of the four Asian Tigers, which underwent rapid industrialisation and strong growth between the 1960s and 1990s. GDP growth averaged 10% annually between 1962 and 1994. This spectacular performance, which was named the Han River Miracle, was fuelled by annual export growth of 20% annually, in real terms, while savings and investment rose sharply above 30% of GDP. South Korea is an exceptional example of an aid recipient country, which has turned into a high-

income country, with GNI per capita increasing rapidly from US\$ 67 in the early 1950s to US\$ 22,670 in 2012. South Korea has become the world's 15th largest economy.

South Korea suffered a severe liquidity crisis during the Asian financial crisis in the late nineties and relied on a bailout by the International Monetary Fund. This enabled the restructuring and the modernisation of the economy. South Korea has become one of the world's leading countries for Information and Communication Technologies (ICT) and is ranked first in the Bloomberg Innovation Index⁷.

2.3.2. Banknotes and Coins

Volume of
Banknotes
in Circulation



In value terms, South Korea is the country included in the scope of this report, which has experienced the second fastest growth of cash in circulation in value terms, expressed in local currency. Between 2004 and 2015, the value of cash in circulation has increased by 350%.

South Korea has also experienced a strong growth of cash in circulation, in relation to GDP. In 2005, South Korea had the lowest cash in circulation to GDP ratio of all six countries included in the scope of this study at 2.83%. But the ratio has increased steadily following 2009 and reached 5.6% in 2015.

In terms of volume on the other hand, South Korea has experienced the slowest growth, i.e. 28% during the decade 2006-2015. The country has actually experienced

negative growth during the two years 2009 and 2010. This coincides with the introduction of a new denomination of KRW 50,000. Following its introduction, the volume of KRW 10,000 dropped sharply during the consecutive four years. While the denomination was introduced in 2009, by 2015 it represents 27% of volumes and 76% of value.

It is also noteworthy that South Korea has the lowest number of denominations for both notes and coins. There are four notes of KRW 1,000; KRW 5,000; KRW 10,000 and KRW 50,000 and six coins of KRW 1, KRW 5, KRW 10, KRW 50; KRW 100 and KRW 500.

7: <http://www.bloomberg.com/graphics/2015-innovative-countries/>

2.3.3. The Cash Cycle

The Bank of South Korea holds the exclusive right to issue banknotes and coins in South Korea. It is committed to providing the public with optimal currency service for their economic activities. The Bank secures a stable currency supply to meet currency demand, and issues commemorative coins to mark and publicise national events. In addition, the Bank strives to prevent counterfeits or forged banknotes from entering into circulation through various measures, for example, by publicising methods to identify counterfeits and reinforcing measures to prevent counterfeiting, with the aim of creating an environment where the public can feel confident and secure in using currency.

The South Korea Minting and Security Printing & ID Card Operating Corporation - KOMSCO - is the sole supplier of Korean currency and operates under the direct control of the government. Its major function is to manufacture the banknotes, coins, and other special printed items, including bonds, postage stamps and special government certificates. It also manufactures the papers needed for the printing of the above items, and other special paper. KOMSCO is active on the export market and sells both

paper and notes. It won a major contract for Indonesia in 2015. In 2015, the company supplied 1.36 billion pieces of banknotes and coins to the Bank, an increase of 15.2% from the previous year⁸. The production of banknotes increased by 10.4%, mainly due to the 50,000 won note, and coin minting increased by 21.3%, mainly due to 500 won and 100 won coins. The total value of supplied currency was recorded at 15.53 trillion won, an increase of 55.6% from the previous year, due to a sharp increase in both banknotes and coins. This contradicts numerous media reports claiming that the country is becoming cashless.⁹

The notes are designed by the Bank of South Korea in co-operation with KOMSCO.

The Bank of South Korea has a network of 7 cash centres. There is no recirculation policy per se, but the central bank has established guidelines. Commercial banks are incentivised to return low-denomination notes to the Bank. Overall, the quality of notes in circulation is good but the bank is looking at improving the quality and durability of low denomination notes.

Four CIT companies operate in South Korea.

2.4 PHILIPPINES

2.4.1. Overview

Population (millions) (2015)	101
GDP (in USD billions) (2015)	292
Banknotes in circulation (in million pieces)	3,846
Number of banknotes/person	38
Account at a financial institution (% age 15+) 2014	31
Debit card (% age 15+) 2011	20.5
ATMs per 100,000 adults 2015	25
Commercial bank branches per 100,000 adults 2011	8.8

Source: World Bank, Global Findex Database, BSP

Among the major economies in the region, the Philippines trailed only behind India in 2016, in terms of economic growth.

8: Bank of Korea 2015 Annual Report

9: <http://www.reuters.com/article/us-south-korea-cash-breakingviews-idUSKBN13R00T>

COUNTRY PRESENTATIONS

The Philippines is one of the most dynamic economies in the East Asia region, with sound economic fundamentals and a globally recognised competitive workforce. Growth in the Philippines has been on average above 5% in the past decade, significantly higher than in previous decades.

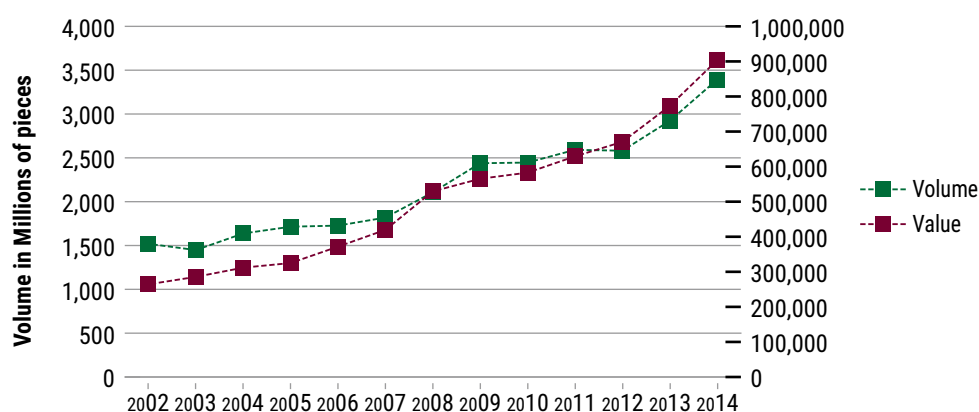
The Philippines remains a strong performer in the region, despite slow global growth. Following high growth exceeding 6% between 2010 and 2015, the Philippines registered further solid growth in 2016 as real GDP expanded by 6.9%. Among the major economies in the region, the Philippines trailed only behind India in 2016. On the supply side, the services sector remained the main growth engine, whereas the share of industry output has been expanding, driven by the double-digit expansion in construction and the steady growth of the manufacturing sector. On the demand side, robust growth of private consumption and the strong pick up of capital formation and government spending in the second half of 2015 tempered weak external demand.

International remittances, which amounted to approximately 9.8% of GDP in 2016, remain an important source of income for many Filipino families and thus one of the main drivers of private consumption. In January 2017, cash remittances from Overseas Filipino Workers (OFW) grew 3.6% from the same month of the previous year to a USD 2.2 billion¹⁰. Remittances in December came mainly from the United States, Saudi Arabia, the United Arab Emirates, Singapore, the UK, Japan and Qatar.

Widening economic opportunities across sectors and the government's support programs are helping to improve the welfare of the poor. Recent estimates suggest that poverty incidence decreased gradually from 25.2% in 2012 to 21.6% in 2015. Likewise, the proportion of Filipino families in extreme poverty was estimated at 5.7% from the 7.5% recorded in 2012.

2.4.2. Banknotes and Coins

Volume
and Value
of Banknotes
in Circulation



The current banknote series is composed of six denominations, namely 20-Piso, 50-Piso, 100-Piso, 200-Piso, 500-Piso, and 1000-Piso. Each denomination integrates the important historical, natural, and cultural aspects of life in the country. The series features famous Filipinos and iconic natural wonders of the Philippines, while the coins depict the Philippines' national symbols.

During the 2004-2015 decade, the Compound Annual Growth Rate of banknotes in circulation was of 10.9% in value terms and 7.9% in volume.

¹⁰: <http://www.focus-economics.com/countries/philippines/news/remittances/remittances-continue-to-grow-in-december>

2.4.3. The Cash Cycle

The Bangko Sentral Ng Pilipinas (BSP) has the exclusive power and authority to issue the national currency. BSP notes and coins are issued against, and in amounts not exceeding, the assets of the BSP. All notes and coins issued by the BSP are fully guaranteed by the government and are considered legal tender for all private and public debts.

The BSP has three Regional Offices and 19 Branches across the country. These offices and branches perform currency operations, cash administration, gold buying operations (La Union and Davao only) and economic surveillance. The BSP is responsible for all shipments of currency to the regional offices and branches. Considering that the Philippines is an archipelago, with over 7,000 islands, the BSP continues to find ways to improve logistics for currency shipment.

As of end-December 2016, there were 602 head offices of banks and 10,576 other offices. Universal and commercial banks accounted for 42 head offices and 6,195 other offices, Thrift banks, including microfinance-oriented banks, accounted for 60 head offices and 2,116 other offices. Rural and Cooperative banks accounted for 500 head offices and 2,265 other offices.

As of end-December 2016, there were 19,084 ATMs. The deployment of ATMs has been leading to an increase in demand for higher denominations.

Pursuant to its mandate of maintaining the integrity of the Philippine currency, the BSP operates a clean note policy. The policy aims to effect an expeditious withdrawal from circulation of unfit notes and ensure that the general public can still recognise the security features. The BSP replaces unfit notes with new ones. Banks are required to

deposit unfit notes. The BSP has adopted a pricing policy aimed at incentivising banks to deposit unfit notes. Unfit notes are deposited free of charge whereas fit notes and a mix of fit and unfit notes are charged a deposit fee. By law the BSP is not authorised to delegate its mandate of issuing the national currency. This prevents the BSP from introducing a Balance Sheet Relief Mechanism. In line with the implementation of the BSP's Enhanced Cash Management (ECM) services to better serve the country's currency requirements, the BSP recently rationalised the service fee structure for banks' deposit and withdrawal transactions with the BSP and amended some operational processes under the ECM services for greater efficiency. The service fees for withdrawals were waived while those for deposit of mixed banknotes were raised. The penalty for fit banknotes found in unfit deposits was also increased. The rationalisation of service fees aims to encourage banks to withdraw new banknotes, thereby accelerating the replacement of unfit banknotes in circulation which is supportive of the BSP's Clean Note Policy.

There are two major Cash-in-Transit companies: G4S and ATP. Most banks have outsourced the transportation and some have started to outsource their cash centres. The BSP, however, only transacts directly with banks.

In terms of banknote processing, the BSP recently acquired high-speed automated banknote processing machines to augment the existing processing lines, which enabled the attainment of higher verification throughput and lesser turn-around time, from three months to 30 banking days. Soiled banknotes, mostly comprised of unfit low denomination banknotes, are processed manually.

COUNTRY PRESENTATIONS

2.5. SINGAPORE

2.5.1. Overview

Population (millions) (2015)	5.5
GDP (in USD billions) (2015)	293
Banknotes in circulation (in million pieces, 2015)	1,047
Number of banknotes/person	190
Account at a financial institution (% age 15+) 2014	96
Debit card (% age 15+) 2014	89
ATMs per 100,000 adults 2015	59
Commercial bank branches per 100,000 adults (2015)	10

In the decades after independence in 1965, Singapore rapidly developed from a low-income country to a high-income country.

Source: World Bank, Global Findex Database, MAS

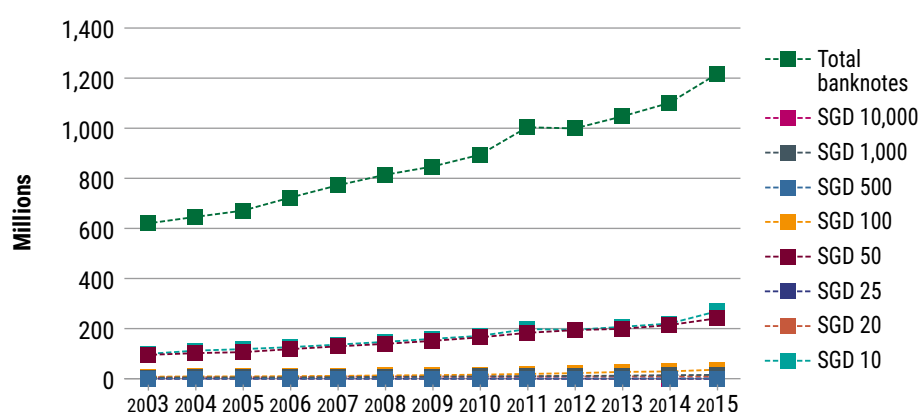
Singapore is a high-income economy with a gross national income of \$55,150 per capita in 2014. The country provides the world's most business-friendly regulatory environment for local entrepreneurs and is ranked amongst the world's most competitive economies.

In the decades after independence in 1965, Singapore rapidly developed from a low-income country to a high-income country. GDP grew at an average of 7.7% since independence; in the first 25 years growth topped 9.2%. Per capita GDP over the same periods grew by 5.4% and 7.2%.

Rapid industrialisation took momentum in the 1960s and, by the end of the decade, manufacturing had become the lead sector of the country's economic growth. By the early 1970s, Singapore had reached full employment. In the 1980s, Singapore had joined the ranks of Hong Kong, South Korea and Taiwan among the newly industrialising countries in Asia. Presently, the strong manufacturing and services sectors have become the twin pillars of the Singapore economy. There is a wide range of businesses, with a particular focus on high value-added activities.

2.5.2. Banknotes and Coins

Volume of Banknotes
in Circulation



The Monetary Authority of Singapore (MAS) is the sole authority that issues Singapore notes and coins. It is responsible for maintaining the integrity, security, quality and confidence in the Singapore currency. MAS took over the currency issuance function following the merger with the Board of Commissioners of Currency, Singapore in October 2002.

All notes and coins issued by MAS are legal tender in Singapore, and are fully backed by external assets in the Currency Fund. The MAS also issues numismatic notes and coins to commemorate significant national achievements, inspire Singaporeans to celebrate their political, cultural and social heritage and to cater to collectors' interests.

In order to facilitate economic and trade relations, Brunei, Malaysia and Singapore adopted a system of free interchangeability of their respective currencies, which took effect from 12 June 1967. This tripartite arrangement was terminated in 1973 when Malaysia opted out of it. However, Brunei and Singapore decided to continue with the arrangement, which continues today.

Under the agreement, each country undertakes to accept the currency issued by the other and to exchange them, at par and without charge, into their own currency. In other words, the two currencies are «customary tender» when circulating in the country in which they are not legal tender. Banks and retailers will thus accept from the general public, including retailers, Brunei currency at par for deposit. Hence, members of the public and businesses can safely accept Brunei currency received for payment.

Singapore has a surprisingly large mix of banknotes with 11 denominations in circulation. Three denominations are no longer issued: the SGD 10,000 was abandoned in October 2015 for anti-money laundering reasons; the SGD 20 was discontinued when the 1984 Ship series was introduced, and the SGD 500 when the portrait series was introduced in 1999. But there is no demonetisation and the notes remain legal tender.

2.5.3. The Cash Cycle

The MAS is responsible for wholesale part of the cash cycle. Cash-in-transit companies and commercial banks manage the retail part. There are three major Cash-in-Transit companies CISCO, the market leader, CERTIS and Brink's. There is a trend for banks to outsource cash management.

There is no interbank recirculation. It is not forbidden but banks have not implemented it.

The MAS has a fee policy which encourages recirculation: withdrawals are free of charge but there is a fee of SGD 3 per bundle for deposits. Deposits are sorted by denomination but there is no commercial fitness sorting. Therefore MAS does the majority of the fitness sorting.

There have been thoughts about decentralising processing, but due to the size of the country it does not make sense. The price of property is a major obstacle to decentralisation. Coins on the other hand have been outsourced.

The MAS has moved into a new facility in 2000 and has built a highly automated cash centre, which includes automated warehousing, Automatic Guided Vehicles, robotics, automated packaging, conveyor systems and online destruction. Paper and polymer notes are processed separately.

The SGD 2 and SGD 5 are processed by CERTIS.

COUNTRY PRESENTATIONS

2.6. THAILAND

2.6.1. Overview

Population (millions) (2015)	65.7
GDP (in USD billions) (2015)	395
Banknotes in circulation (in million pieces, 2015)	5,166
Number of banknotes/person	78.6
Account at a financial institution (% age 15+) 2014	78
Debit card (% age 15+) 2014	55
ATMs per 100,000 adults 2015	79
Commercial bank branches per 100,000 adults (2015)	11

Source: World Bank, Global Findex Database, Bank of Thailand

Thailand's economy grew at an average annual rate of 7.5% in the late 1980s and early 1990s, creating jobs that contributed to pull millions of people out of poverty.

Thailand reached upper-middle income economy status in 2011. Over the last four decades, Thailand has made remarkable progress in social and economic development, moving from a low-income country to an upper-income country in less than a generation. As such, Thailand has been one of the widely cited development success stories, with sustained strong growth and impressive poverty reduction, particularly in the 1980s.

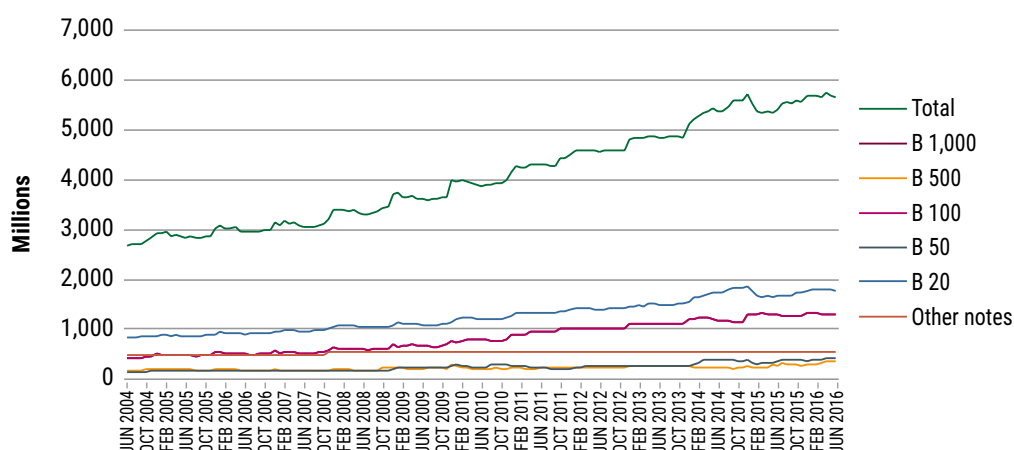
Thailand's economy grew at an average annual rate of 7.5% in the late 1980s and early 1990s, creating jobs that contributed to pull millions of people out of poverty. Gains across multiple dimensions of welfare have been impressive: more children are now getting more years of education, and virtually everyone is now covered by health insurance. Poverty has declined substantially over the last 30 years from 67% in 1986 to 11% in 2014 as incomes have risen. However, poverty and inequality continue to pose significant challenges, with vulnerabilities as a result of faltering economic growth, falling agricultural prices, and on-going droughts. Poverty in Thailand is primarily a rural phenomenon. As of 2013, over 80% of the 7.3 million poor live in rural areas. Moreover, an additional 6.7 million were living within 20% above the national poverty line and remained vulnerable to falling back into poverty.

Although inequality has declined over the past 30 years, the distribution in Thailand remains unequal compared with many countries in East Asia. Significant and growing disparities in household income and consumption can be seen across and within regions of Thailand, with pockets of poverty remaining in the Northeast, North, and Deep South.

According to the World Bank, the Thai economy faces headwinds, and growth has been modest, at 2.8% in 2015 after 0.9% in 2014, partly on the basis of government consumption and investment, and partly on declining imports. The outlook for 2016 is 2.5%. The rate of economic recovery and reigniting growth will depend on how fast Thailand can overcome factors constraining growth and promote a more inclusive growth model. There are opportunities in the horizon, including expanding trade through enhanced integration with the global economy, bolstering growth by implementing transformative public investments to crowd-in private capital, stimulate domestic consumption, and improving quality of public services across the entire country. This will support a resumption of higher, more balanced, growth that eliminates extreme poverty and boosts shared prosperity for all citizens.

2.6.2. Banknotes and Coins

Volume of
Banknotes
in Circulation



Over the last five years, banknotes in circulation rose consistently with an annual average growth rate of around 5% by value. In terms of value, the 1,000 baht notes account for approximately 80% of notes in circulation. While the low denominations (50 and 20 baht notes) each represents less than 5% of the total value. However, in terms of volume, the 20 baht notes accounts for roughly a third of notes in circulation.

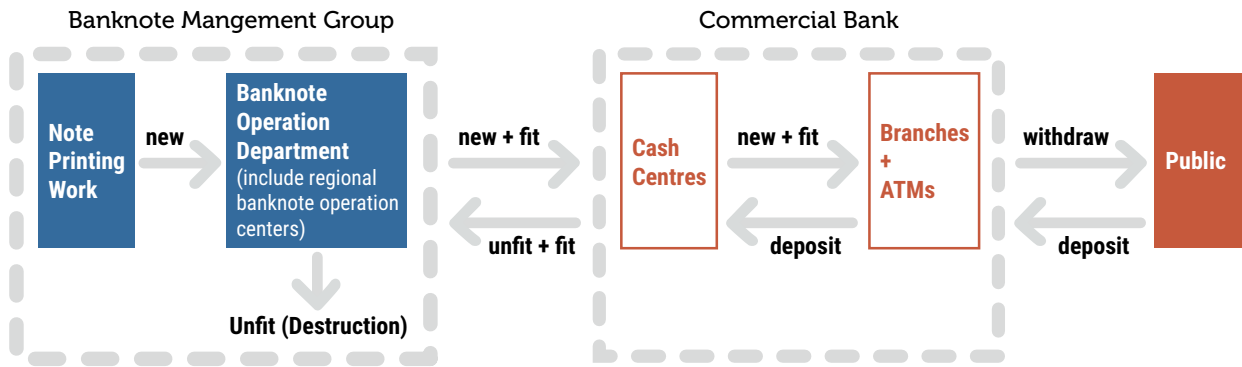
Thailand is the country which has experienced the strongest growth in banknote volumes over the past decade, amongst the six countries covered in this report. Volumes have doubled between 2005 and 2014). This represents a Compound Annual Growth Rate of 7.2%.

2.6.3. The Cash Cycle

Within the Bank of Thailand, the Banknote Management Group (BMG) is a semi-autonomous group responsible for all banknote operations from production to destruction which consists of 6 departments: Note Printing Works, Banknote Operation Department, Banknote Strategic Planning Department, Accounting and Supply Departments, HR Management and Development Department, and Banknote Research Department. BMG governed by the BMG Committee, chaired by the Deputy Governor. Its mission is to ensure the sufficient supply of clean and secure banknotes in circulation with efficient management that maintains public confidence and satisfaction.

COUNTRY PRESENTATIONS

The Thai Cash Cycle



Referring to the above diagram, the Banknote Operation Centres distribute both new and fit banknotes to commercial banks via cash centres. Then, each commercial bank dispatches such banknotes to their branches and ATMs. Finally, the public access banknotes via branches and ATMs.

Banknote Operation Centres functions include:

- The distribution of new and fit banknotes to cash centres
- The processing of unfit banknotes from cash centres
- The detection of counterfeit banknotes
- The eradication of unfit banknotes
- The regulation of cash centres

The majority of cash centres are run and owned by the commercial banks, even though some of them are owned by Cash-in-Transit companies.





3

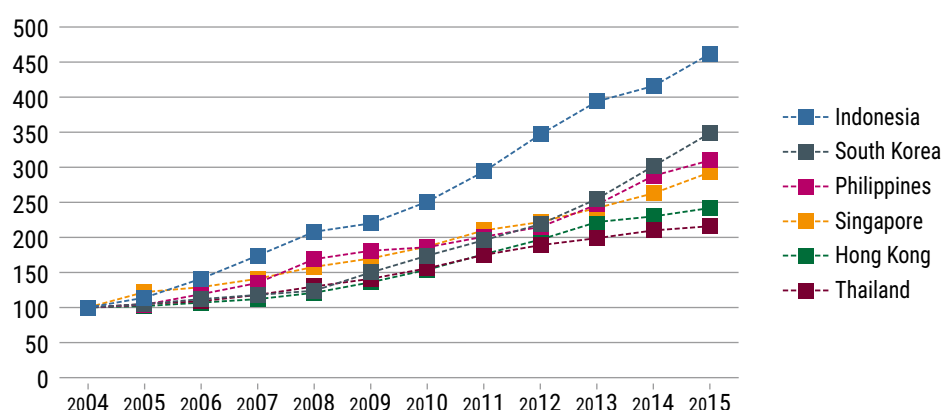
CASH DEMAND



CASH DEMAND

3.1. IN VALUE

Evolution of Value of Cash (notes and coins) in Circulation
2006 = 100



The six countries included in the scope of this paper have experienced strong and sustained growth of cash in circulation during the period 2004-2015. Cash in circulation has increased by a factor of 4.5 in Indonesia ; between 3 and 3.5 in South Korea, the Philippines and Singapore and between 2 and 2.5 in Thailand and Hong Kong. The Compound Aggregate Growth Rate varies from 7.23% in Singapore to 14.94% in Indonesia.

Value of Notes in Circulation	CAGR 2004-2015
Indonesia	14.94
Hong Kong	8.38
South Korea	12.05
Philippines	10.85
Thailand	10.28
Singapore	7.23

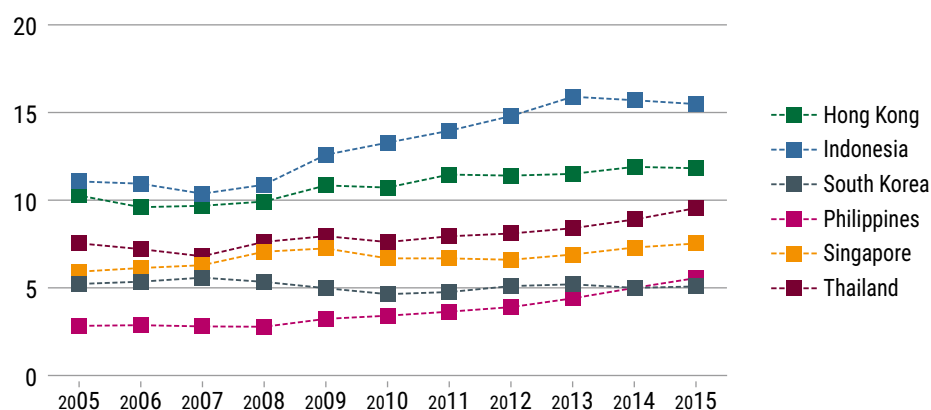
In the case of Indonesia, inflation has been a key factor explaining higher growth as the country has experienced relatively higher inflation the other countries.

Economic development does not appear to be correlated to growth of cash in circulation. Cash has grown in both mature and developing economies.



3.2. IN RELATION TO GDP

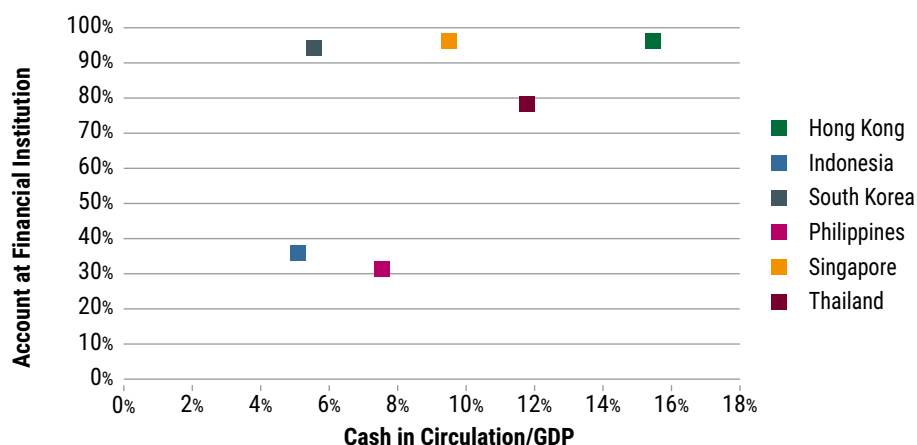
Cash in Circulation / GDP



Measured in relation to GDP, the level of cash in circulation (CIC) varies significantly from country to country, from approximately 5% in South Korea and Singapore to over 15% in Hong Kong. A number of factors influence the CIC/GDP ratio including macro-economic, historical, cultural, micro-economic reasons. However, within a given country the relationship between CIC and GDP appears to be relatively linear.

With the exception of Indonesia, all countries have seen an increase in the CIC/GDP ratio over the past decade. In South Korea, for instance, the ratio has increased from 2.83% in 2004 to 5.56% in 2015. Indonesia is the only country where the ratio has remained stable over the decade.

Cash in Circulation and Maturity of Payment Markets



There does not appear to be a correlation between the maturity of the economy and the level of cash in circulation. More surprisingly, the sophistication of the domestic payments market is not correlated with the level of cash in circulation. Hong Kong, Singapore and South Korea all have amongst the most advanced payments markets in the

world, measured both in terms of penetration of bank accounts and debit cards which are close to 100%, as well as in terms of technology. Yet, the CIC/GDP is relatively high. On the other hand, the account penetration in Indonesia and the Philippines is below 40% but the CIC/GDP ratio is towards the lower end of the range.

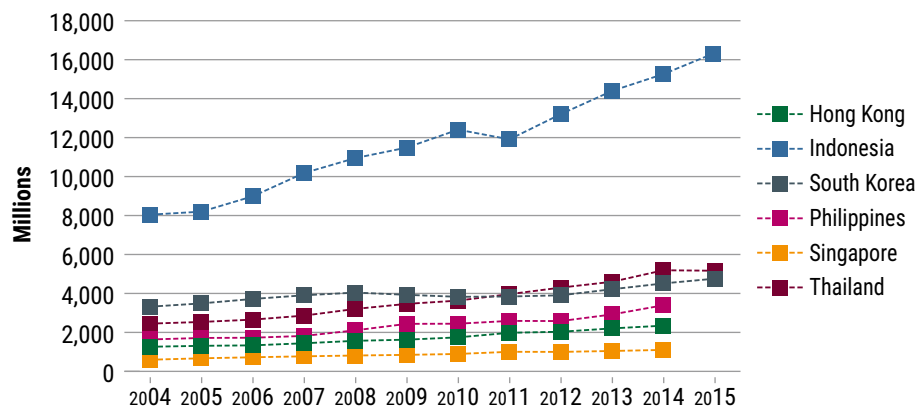
CASH DEMAND

In the three developed economies and to a lesser extent in Thailand, there has been an acceleration of the growth of the CIC/GDP ratio following the start of the Global Financial Crisis in 2008. This phenomenon has been

observed in other economies and is mostly due to an increase in savings in cash, as low interest rates have reduced the opportunity cost of holding cash.

3.3. IN VOLUME

Number
of Banknotes



The total number of banknotes in the six countries amounts to approximately 32 billion pieces in 2015. Indonesia represents half of the total. As a point of comparison, there were 38.1 billion pieces in circulation in the US and 18.9 billion in the euro zone.

With the exception of South Korea, the volumes have approximately doubled in all countries over the period 2004-2014. This represents a Compound Annual Growth (CAGR) rate between 6.3 and 7.8%. In South Korea, volumes grew by 36% between 2004 and 2014, representing a CAGR of 3.1%.

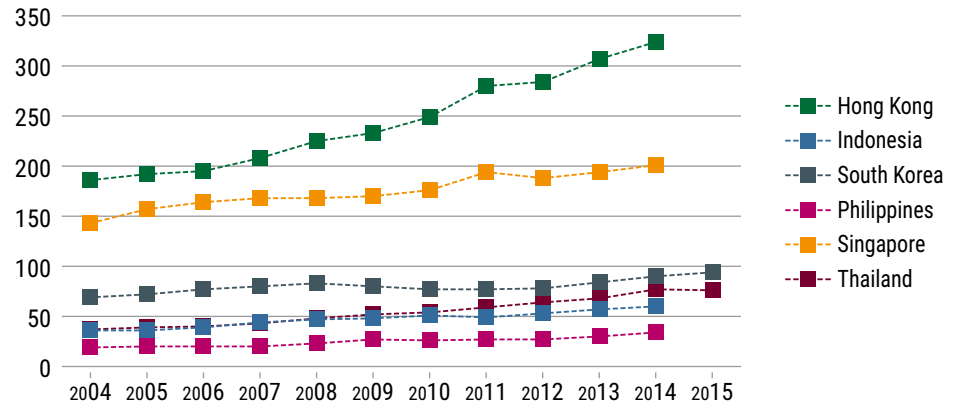
In South Korea, the volumes declined following the introduction of a high-denomination note in 2009. As a result, the volumes declined for three consecutive years, before growth resumed. Indonesia also experienced a decline in 2011 following the introduction of a new denomination.

The number of banknotes per person varies by a factor of 1 to 10, from 34 in the Philippines to 324 in Hong Kong. All countries, have seen a continued increase in the metric. Surprisingly, Hong Kong which already had the highest value in 2004, is the country which has experienced the fastest growth: +74% between 2004 and 2014.

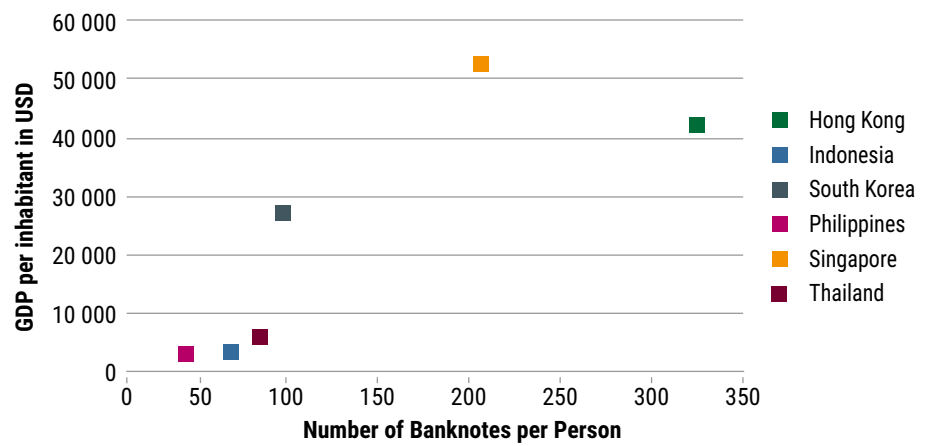
It is worth noting that there is a positive correlation between the number of notes and the GDP per capita in USD.

The number of notes per person in Singapore and Hong Kong is particularly high in comparison to other mature economies (100 in the USA, 98 in Japan, 47 in the euro-zone).

Number of Banknotes per Person



Number of Notes and GDP per Inhabitant



3.4. DRIVERS OF CASH GROWTH

Numerous factors account for the demand of banknotes and coins, including macro-economic factors - GDP, inflation, interest rates, demographics - micro-economic factors - the density of the banking infrastructure, the availability of alternative payment instruments, as well as historical and socio-cultural factors.

Across all six markets, five main factors have been identified as drivers and three as inhibitors of cash demand.

3.4.1. GDP

We have established that there has been a linear relationship between cash in circulation and GDP. A growing economy leads to an increase in the number of transactions and consequently the demand for cash.

These six countries have experienced strong economic growth, on average during the period, even if it has been volatile, with Hong Kong and Thailand facing negative growth in 2009, for instance. The CAGR of GDP growth between 2004 and 2015 ranges from 5.4% in South Korea to 15.8% in Indonesia.

	Hong Kong	Indonesia	South Korea	Philippines	Singapore	Thailand
GDP CAGR 2004-2015	5.62	15.81	5.38	9.05	6.91	6.24
Banknote Volumes CAGR 2005-2014	6.68	7.15	2.91	7.88	5.66	8.28

3.4.2. Interest Rates

In the three mature economies - Hong Kong, South Korea and Singapore - one can observe an acceleration of growth of cash in circulation following the Global Financial Crisis. This coincides with a drop in interest rates, which reduces the opportunity cost of holding cash. As in many other countries around the globe, there has been an increase in cash savings, in the wake of the Global Financial Crisis. This trend results in demand for high denomination notes.

3.4.3. Festive demand

The Chinese New Year is a lot more than lion dances and firecrackers. It also involves a tradition of gifting and in particular giving “red envelopes” or *hóngbāo* (紅包). A red envelope is simply a long, narrow, red envelope with money in it. Traditional red envelopes are often decorated with gold Chinese characters like happiness and wealth. Red envelopes are handed out to younger generations by their parents, grandparents, relatives, and even close neighbours and friends during Chinese New Year.

According to Joanna YL Shi¹¹, “The Chinese New Year exerts a major moving holiday effect on many economic variables in Hong Kong. Consumption activity typically surges before the holidays, scales down during the holidays, and gradually returns to normal levels afterwards. The demand for cash is influenced by the rise in consumption around the festival and the tradition of giving “red envelopes”. Over the years, the increase in cash holdings ahead of the holidays has been largely stable, ranging from HK\$19-23 billion.” The red envelope tradition largely explains the reintroduction of a HK\$10 note in 2002, after it had been replaced by a coin in the 90s.

The red envelope tradition is lively in Hong Kong and Singapore but is also commonplace amongst Chinese communities throughout Asia. In some cases, the tradition has been appropriated and adapted by other communities. In the Philippines for instance, it is customary to give “aguinaldo” for Christmas.

11: *Demand for cash around Chinese New Year*, Joanna YL Shi, Hong Kong Monetary Authority Quarterly Bulletin, June 2004
<http://www.hkma.gov.hk/media/eng/publication-and-research/quarterly-bulletin/qb200406/fa2.pdf>

In Indonesia, the Ramadan period and the Eid al-Fitr festival lead to an increase in banknote demand. In 2015, as much as Rp140.0 trillion was withdrawn in the Ramadan/Eid al-Fitr period, or 111.8% of cash needs based on the projection of banks. This increased demand is due mainly to increases in withdrawals of Rp100,000 and Rp50,000 banknotes as well as of lower denominations of Rp 20,000, RP 10,000, RP 5,000 and Rp 2,000. Similarly, during the 2015 Christmas and end of year holiday period, withdrawals of currency reached Rp85.6 trillion, or 106.0% of cash needs based on the central banks' projection¹².

3.4.4. Contingency

Cash plays a key contingency role for national payments systems in case of natural disasters or financial crises. The cash cycle demonstrated its resilience during natural disasters such as the 2004 Tsunami which hit south-east Asia, and Typhoon Bopha which hit the Philippines in 2012. Cash also plays a role in the event of technology failures. In 1999, as the millennium approached, demand for banknotes increased significantly as consumers feared bank information systems could be affected by the Y2K computer bug.

For many experts, including the World Bank, the impact of weather-related events will likely increase in the future under the combined pressure of global warming and the expansion of many cities in hazard-prone areas¹³.

In this region, which is regularly subject to earthquakes, typhoons and tsunamis, central banks have developed robust business continuity plans to ensure the distribution of cash during natural disasters.

In Indonesia, the central bank has strict contingency planning which include iron stocks - stocks under which the central bank cannot go - and a back-up system if a branch is unable to operate. During the 2004 Tsunami in Aceh, the system proved robust as branch functions were rebuilt within a week.

On 8 November 2013, Typhoon Haiyan devastated central Philippines. The most powerful storm ever recorded caused flooding, landslides, and widespread damages. The islands of Leyte and Samar were among the hardest hit, and Tacloban City had 90% of its infrastructure destroyed. The Government estimated that 16 million people were affected, 4.1 million people were displaced and 6,300 people lost their lives.

Humanitarian assistance in cash played a vital part in the reconstruction effort. According to one report, "Whilst in-kind relief dominated the early stage of the response by the humanitarian community, as the situation and markets stabilised, numerous aid agencies transitioned at least a portion of their response to cash assistance. The cash transfer components of the humanitarian response to Typhoon Haiyan comprised some 40% of the entire relief response and totals some USD 845 million. This included cash-based interventions designed to meet some of the affected population's most pressing needs in the areas of food security, livelihoods recovery and shelter."¹⁴



12: 2015 Economic Report on Indonesia, Bank of Indonesia
http://www.bi.go.id/en/publikasi/laporan-tahunan/perekonomian/Documents/PartIII_Policy_Response.pdf

13: <http://www.ibtimes.com/natural-disasters-are-hitting-harder-not-because-global-warming-1141461>

14: *Cash Coordination in the Philippines : A Review of Lessons Learned during the Response to Super Typhoon Haiyan*, Gabrielle Smith, March 2015 <http://www.cashlearning.org/downloads/cash-coordination-philippines-web-2.pdf>

CASH DEMAND

3.4.5. International Travel

The Asia Pacific region is the second most visited region in the world¹⁵; it welcomed 249 million visitors in 2013, a 6% increase over 2012 and 23% of international travellers.

Thailand, Hong Kong, South Korea, Singapore and Indonesia are all ranked amongst the top ten destinations in Asia Pacific.

	World Rank	Asia Pacific Rank	2013 Tourists (millions)	2013/2012 Change
Thailand	10	2	27	19
Hong Kong	12	4	26	8
South Korea	22	6	12	9
Singapore	23	7	12	7
Indonesia	34	9	9	9

Source: World Tourism Organisation

International travellers rely particularly on cash, for several reasons. Security is the first. When they are overseas, consumers are particularly wary of risks associated with card use, including identity theft, card cloning, card confiscation and privacy concerns. The poor exchange

rates or lack of transparency on exchange rates is another factor. Cash also enables travellers to better control their budget and avoid the risk of transactions being denied if they overspend.



15: World Tourism Organisation <http://www.e-unwto.org/doi/pdf/10.18111/9789284416301>

3.5. INHIBITORS OF CASH GROWTH

3.5.1. Poverty

Poverty is commonly defined as the lack of basic needs such as food, safe drinking water, sanitation, clothing shelter and education. For the World Bank, extreme poverty is defined as earning less than USD 1.90 per day. Evidently, poverty also translates into the lack of money.

Three countries are concerned by poverty amongst the six covered by this research: Indonesia, the Philippines and to a lesser extent Thailand. In spite of remarkable progress in the reduction of poverty, as highlighted in the excerpts of World Bank reports below, extreme poverty affects over 44 million people in the three countries. Furthermore, a significant portion of the population remains vulnerable of falling into poverty: 40% of the Indonesians and 10% of Thais live marginally above the poverty line.

Extracts from World Bank Reports

THAILAND¹⁶

Poverty has declined substantially over the last 30 years from 67% in 1986 to 11% in 2014 during periods of high growth and rising agricultural prices. However, poverty and inequality continue to pose significant challenges, with vulnerabilities as a result of faltering economic growth, falling agricultural prices, and on-going droughts. Poverty in Thailand is primarily a rural phenomenon. As of 2013, over 80% of the country's 7.3 million poor live in rural areas. Moreover, an additional 6.7 million were living within 20% above the national poverty line and remained vulnerable to falling back into poverty."

INDONESIA¹⁷

While the poverty rate declined by 1% annually from 2007 to 2011, since 2012 poverty has declined by an average of only 0.3 percentage points per year. Hence out of a population of 252 million, more than 28 million Indonesians still live below the poverty line. Approximately 40% of the entire population remain vulnerable of falling into poverty, as their income hover marginally above the national poverty line, set at 330,776 rupiah per person per month (\$22.60). Another challenge to efforts at reducing poverty – and to the 1.7 million youth who enter the workforce each year – is the slower pace of job creation. Employment growth is now slower than population growth.

PHILIPPINES¹⁸

Recent estimates suggest that extreme poverty in the Philippines, measured by the international poverty line of 1.9 dollars a day (2011 purchasing power parity), decreased from 10.6% in 2012 to 8.4% in 2015. Household income in real terms reported continuous growth. However, natural calamities including the highest number of typhoons ever witnessed during the period of 2013-2015 have muted some of welfare gains. The government's social protection programs, in particular the Pantawid Pamilya conditional cash transfer program, successfully buffered some impacts of the shocks. The poorer segment of the population reported faster growth in household income than the average figure, showing that income inequality is easing downward.

16: <http://www.worldbank.org/en/country/thailand/overview>

17: <http://www.worldbank.org/en/country/indonesia/overview>

18: <http://www.worldbank.org/en/country/philippines/overview>

CASH DEMAND

3.5.2. The Cash Infrastructure

Bringing financial services to the people and particularly in rural areas is one of the key barriers to financial inclusion. As with poverty, there is a stark difference between the three mature economies - Hong Kong, South Korea and Singapore - and the developing countries Indonesia, Philippines and Thailand. Hong Kong and Singapore are global financial centres, ranked respectively 3rd and 4th according to the Global Financial Centre Index¹⁹. South Korea, whose capital Seoul is ranked 14th, has the highest ATM density in the world.

The situation is radically different in Indonesia, the Philippines and to a lesser extent Thailand. In the first two countries, the geography of the archipelagos with respectively 17,000 and 7,500 islands is a further barrier to establishing a comprehensive infrastructure as the remote location of small islands and their limited banking potential discourage banks to reach out. In the Philippines, 36% of municipalities do not have access to a bank branch²⁰. In Indonesia, only 16% of adults in rural areas have an account with a formal financial institution compared to 29% of adults living in urban areas as of 2012²¹. Without access to the physical financial infrastructure, individuals and merchants struggle to obtain and deposit cash. In Thailand, 35% of the country's 878 districts are not serviced by commercial banks.

However, the infrastructure is growing fast. In the Philippines, the number of bank branches grew by 5% in 2013, while the number of ATMs grew by 19%. There were 19,084 ATMs at the end of 2016, compared to only 3,650 in 2000 - a growth in excess of 400% over the last 16 years. Interestingly, in the rural areas where many of the financially excluded people live, ATM expansion has been more rapid. Between 2005 and 2013, the ATM network associated with rural and cooperative banks expanded by more than 700%, from 42 ATMs in 2005 to 339 in 2013²².

3.5.3. Cash Substitution Programmes

Several countries have introduced policies aimed at encouraging the use of digital payments and restricting the use of cash.

Bank Indonesia has conducted education and socialisation activities on the use of non-cash transaction instruments through the organisation of a Non-Cash National Movement (GNNT) festival. The programme is held in Jakarta and all provinces of Indonesia. A number of parties have participated in the implementation of the various activities, including banks Government Ministries, local Government, the national assistance programme, payment system providers, and the general public. The purpose of these activities is to invite all people to use non-cash payment instruments.

The Monetary Authority (MAS) of Singapore commissioned a study in 2016, to take stock of Singapore's payments framework and landscape and create a roadmap to achieve its vision. The study will guide the payments strategy in the years to come. The MAS, together with the Ministry of Finance (MOF), is co-leading an effort to increase the adoption of electronic payments in Singapore. In 2015, two core drivers were identified: streamlining payment card acceptance infrastructure at merchants through interoperable Point-of-Sale systems and enhancing access to real-time payments through the Fast and Secure Transfers (FAST) system. A unified POS would enhance merchant efficiency by simplifying front-to-back process integration and enhance customer experience. Separately, FAST membership has grown from 14 to 19 banks since its launch in 2014, and the limit on FAST transfers has been raised from S\$10,000 to S\$50,000. This has allowed more people to pay for more transactions in real-time.

MAS is also working with the Association of Banks in Singapore (ABS) to develop a Centralised Addressing Scheme that will allow anyone in Singapore to pay someone else via FAST using only his or her mobile number as a proxy.

19: http://www.longfinance.net/images/gfci/20/GFCI20_26Sep2016.pdf

20: <http://www.bsp.gov.ph/downloads/Publications/2015/PhilippinesNSFIBooklet.pdf>

21: <https://www.adb.org/sites/default/files/publication/159308/adb-financial-inclusion-asia.pdf>

22: <https://www.adb.org/sites/default/files/publication/159308/adb-financial-inclusion-asia.pdf>

The Bank of Thailand and the commercial banks have announced national electronic payment objectives, which aim at creating a more cost-efficient payment system (promoting electronic payment and reducing the use of cash). That policy, in the medium-to-long term, may slow down the use of cash and accelerate the use of alternative payments.

One study²³ has measured the impact of the development of electronic payments on cash usage in Thailand. The paper concludes that growth of digital transactions has negatively affected cash in circulation. However, the estimated coefficient of cash-card substitution of 0.15 suggests that a 10% increase in debit cards transactions would result in the reduction of demand for cash transactions of around 1.5%. Given the low degree of debit card usage and the slow change in the payment behaviour, it is unlikely that this development will have noticeable impact on the future use of cash.



23: *The Effects of E-payment Instruments on Cash Usage: Thailand's Recent Evidence and Policy Implications* ; October 2010 ; Rungsun Hataiseree , Payment Systems Department, Bank of Thailand and Wachirawat Banchuen, Thammasat University, Thailand

CASH DEMAND

3.6. PROJECTIONS OF CASH DEMAND

3.6.1. Projection based on historical growth rates

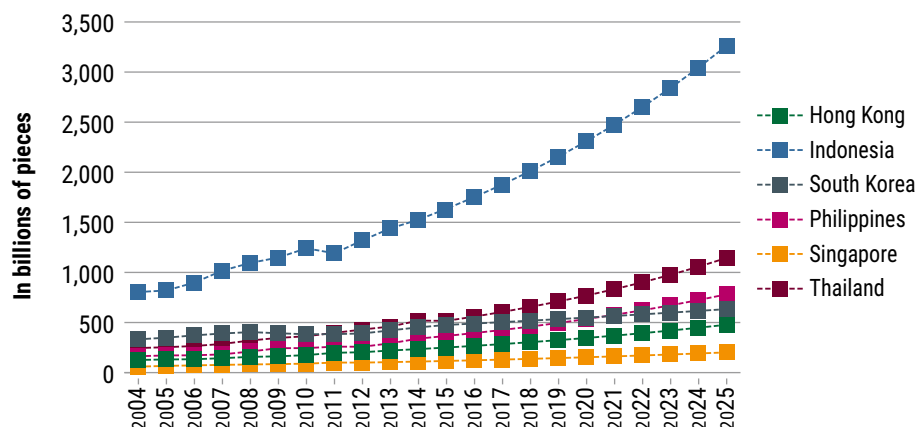
Long term forecasting of cash demand is challenging. As indicated in the previous chapter, numerous factors foster cash demand, including economic growth, population, the development of financial services, while others inhibit growth, namely poverty, lack of infrastructure for the circulation of cash, policy.

Modelling future cash demand requires a fine understanding of the interactions between these variables with one another. Furthermore, previous studies²⁴ have also illustrated that “Black Swans”²⁵ have had major

impacts on cash demand, as has been the case for example with the Year 2000 changeover, the 2008 global financial crisis or natural catastrophes such as the 2004 tsunami or the Fukushima earthquake and tsunami.

The chart provides a simple projection of cash demand for the next ten years if growth of banknote demand follows the same pattern as during the last decade. According to this projection, between 2015 and 2025, banknotes volumes would grow by 122% in Thailand, 113% in the Philippines, 99% in Indonesia, 91% in Hong Kong, 73% in Singapore and 33% in South Korea.

Projections of Future Banknote Volumes based on Historic Growth Rates



24: Future of Cash 2012 - AGIS Consulting

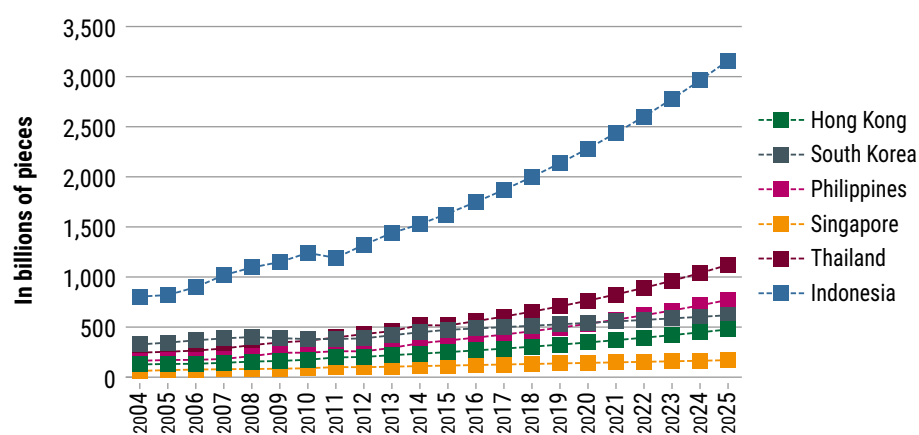
25: The **black swan theory** was developed by Nassim Nicholas Taleb, a statistician and essayist. It describes an event that comes as a surprise, has a major impact, and is often inappropriately rationalised after the fact with the benefit of hindsight.

3.6.2. Projection based on population growth

Another approach to projecting growth consists in looking at the evolution of the number of banknotes per person. In the chart below, we have applied the growth of the number of banknotes per person during the 2003-2012 period

to the UN Population Prospects, with a medium fertility scenario. The results are very similar to the previous approach, with the exception of Singapore. Volumes would grow by 117% in Thailand, 111% in the Philippines, 93% in Indonesia, 90% in Hong Kong, 46% in Singapore and 31% in South Korea.

Projections of
Banknote Volumes
based on
Population Growth





4

BANKNOTES

4.1. PRODUCTION

Five of the six countries covered by this research, have their banknotes printed by the central bank or a national security printer.

Singapore is the sole exception. Banknotes are sourced from commercial printers following an open tender process. Substrates and features are sourced directly by the printers. For many years, De La Rue printed Singapore notes at its regional printing works located there. Following a rationalisation of the group's activities, the plant was closed. Considering, the low volumes involved, the MAS have no plans to produce banknotes in Singapore.

In Hong Kong, paper notes are printed locally by the Hong Kong Note Printed Limited (HKNPL). Polymer notes are outsourced. In April 1996, the HKMA acquired the plant from De La Rue on behalf of the Government.. The acquisition of the plant enables the Government, through the HKMA, to be directly involved in the production of Hong Kong currency notes, which is in line with the responsibilities conferred upon the Government under the Legal Tender Notes Issue Ordinance and the Basic Law. In March 1997, the Government sold 15% of its shareholding in HKNPL to the China Banknote Printing and Minting Corporation. In October 1997, the Government sold a total of 30% of HKNPL issued shares, at 10% to each of the three note-issuing banks. The Government continues to exercise management control and maintains a majority stake in HKNPL, with the Chief Executive of the HKMA as the Chairman of the company. The notes are designed by the issuing banks, in co-ordination with the HKMA, which has implemented since the 2010 series a standardised system of security features.

In Indonesia, banknotes are printed at Perum Peruri, which is regulated by the Currency Law. Peruri is a state-owned enterprise, founded in 1971 under the authority of the State Ministry of State Owned Enterprises. Coins are also minted at Perum Peruri. The company operates a single facility, 70 Km from Jakarta, which is one of the largest print-works in the world. The central bank is responsible for the choice and the procurement of substrates and the security features.

In South Korea, all notes are printed locally by the Korean Minting, Security Printing & ID Card Operating Group (KOMSCO) which is 100% government-owned. The notes are designed by the Bank of South Korea in co-operation with KOMSCO. The company is active on the export market, where it sells both paper and notes. It has won an important contract in Indonesia in 2015. The South Korea Minting and Security Printing Corporation supplied 1.36 billion units of banknotes and coins to the Bank of South Korea in 2015, an increase of 15.2% from the previous year. Banknotes saw an increase of 10.4%, mainly due to the 50,000-won note, and coins increased by 21.3%, mainly due to 500-won and 100-won coins. The total value of supplied currency was recorded at 15.53 trillion won, an increase of 55.6% from the previous year, due to a sharp increase in both banknotes and coins.

In the Philippines, a portion of banknotes are produced in-house at the BSP's Security Plant Complex. The remainder are imported. BSP has been increasing capacity and aims to become more self-sufficient. It is focusing on reducing wastage. In 2015, the BSP produced 1.7 billion pieces of banknotes.

In Thailand, banknotes are produced by the Banknote Management Group, Bank of Thailand. In 2013, the total number of banknotes produced was 2.8 billion notes, a 7.3% decrease compared to the previous year. New machines were acquired to expand production capacity in response to growing demand for banknotes.

4.2. SUBSTRATES

The majority of banknotes in the region are printed on paper substrates. The exceptions are the HK\$10 and SGD2; SGD5 and SGD10.

The Philippines however use a unique substrate, which is based on a blend of cotton and abaca fibres. Abaca is an indigenous plant more popularly known as “Manila hemp”. The Bangko Sentral ng Pilipinas investigated the feasibility of using 100% abaca paper. The result of the study was encouraging and laid the groundwork for further studies on abaca-cotton blends, which involved, in various stages, local paper and abaca pulp producers, European banknote paper manufacturers and the laboratories of the Security Plant Complex. In 1999, the BSP invited its banknote paper suppliers to pursue the development of an abaca-cotton blend that would meet the current specifications for banknote paper. The study resulted in an 80% cotton-20% abaca banknote paper characterised by high folding endurance, tear resistance, tensile strength, wet strength and bursting strength. Opacity values are a bit low, owing to the less voluminous fibres of abaca compared with cotton fibres. The cotton-abaca blend is now found in all peso denominations. The first such issue came out in the 2001 series²⁷. The Bangko Sentral ng Pilipinas was a pioneer in the usage of a paper with an antimicrobial treatment since the 2010 series. The key justification is to protect people working in cash centres from pathogenic microbes.

Several central banks are carrying out research to further increase the durability of banknotes. In Thailand, the Banknote Management Group is analysing various coating techniques and has carried out a circulation trial of coated banknotes to observe the life spans of banknotes.



27: *Abaca in Philippine Banknotes*, Armando L. Suratos http://www.bsp.gov.ph/publications/regular_bsrevjul02.asp



5

CASH CYCLE

CASH CYCLE

5.1. CASH DISTRIBUTION POLICIES

The six countries covered in this report provide a diverse spectrum of currency distribution models. At one end, Hong Kong offers an illustration of a highly delegated model as it is one of the few countries in the world where the monetary authority has entrusted commercial banks with functions such as the design, issuing and destruction of banknotes, which are traditionally viewed

as core central bank responsibilities in most countries. At the other end, the Philippines are representative of a centralised model. By law the BSP is not authorised to delegate its mandate. This prevents the BSP from introducing a Balance Sheet Relief Mechanism. The fee structure aims at encouraging commercial recirculation.

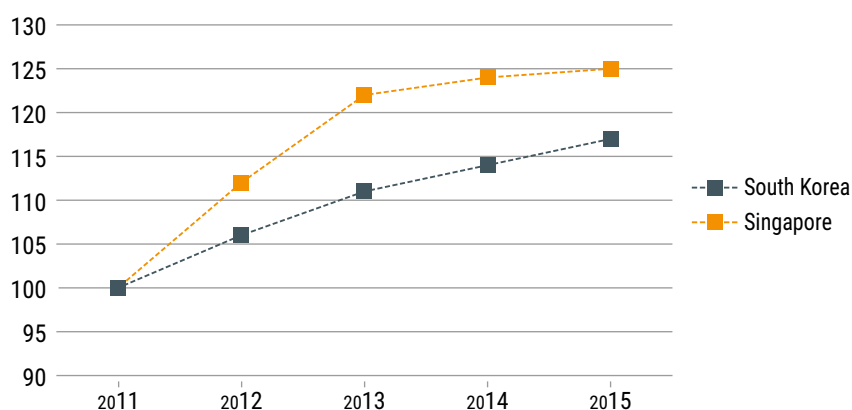
	Hong Kong	Indonesia	South Korea	Philippines	Singapore	Thailand
Central Bank branches	1	42	7	22	1	10
Balance Sheet Relief Mechanism	No	In Progress	No	No	No	No
Fitness Standards	Yes	Yes	Yes	Yes	Yes	
Clean Note Policy	Yes	Yes	Yes	Yes	Yes	
Lodgement and/or withdrawal fee	No	No		Yes	Yes	

5.2. A GROWING CASH INFRASTRUCTURE

Hong Kong, South Korea and Singapore have a dense infrastructure for the distribution and collection of cash. In South Korea, which has the highest ATM density in the world, the number of ATMs has declined very slowly since 2013, from 124,236 machines in 2013 to 121,344 in 2015.

In Singapore however, the number is continuing to increase. The number grew by 5%, from 2,669 in 2011, to 2,804 in 2015. More importantly, the value of cash withdrawals is continuing to grow as illustrated by the chart below.

Value of Cash Withdrawals
2011 = 100



Source: Bank for International Settlements

The growth of infrastructure is even more important in the developing markets. According to RBR²⁸, in 2015, the value of cash withdrawals grew by 15% alone in the Philippines and Indonesia. In Thailand the number of ATMs grew by 9%, from 56,851 in 2013, to 61,817 in 2014. The value of cash withdrawals grew by over 150% from 2,966 billion Baht in 2005 to 7,508 billion Baht in 2014. Thais predominantly withdrew cash from automated machines more often than bank branches due to convenience as automated machines are abundantly located and can be accessed 24 hours

a day. However, in terms of value, 84.7% came from withdrawal through bank branches, with an average value of 223,658 Baht per transaction while that from automated machines amounted to merely 4,709 Baht per transaction.

The effectiveness of the growing bank infrastructure is nonetheless restricted as the new branches and ATMS are essentially located in urban areas and fail to reach the under-served communities in remote areas or with high poverty rates.

5.3. INNOVATION IN THE CASH CYCLE

The development of the bank and ATM networks is not the only solution to ensure the smooth and efficient distribution of cash. Particularly in remote areas or in areas with high poverty rates, branches and ATMs are ill-suited and costly to maintain. Consequently, innovation has widely contributed to the availability of cash.

In Indonesia, the central bank operates mobile cashier services, which are deployed in markets, colleges, universities, train stations, often in collaboration with welfare organisations as well as the navy. They provide currency exchange as well as small change services in the remote and outermost regions. Bank Indonesia also runs campaigns to facilitate the exchange of coins.

In the Philippines, commercial banks have designed mobile ATMs - a cash-dispenser fitted on a truck - which enable them to extend their reach to remote areas but also serve people on the occasion of events such as concerts, fairs and sports events. The units typically provide cash withdrawals, fund transfers, bill payment, payroll benefits. The mobile ATMs also play a key role in disaster recovery programmes and are often deployed in areas which have been devastated by typhoons.

The Hong Kong Monetary Authority has geared its efforts towards the collection of coins. In 2014, the Coin Collection programme was launched and was the first to use two Coin Carts, which are trucks, each equipped with two coin sorters. All 18 districts in Hong Kong are covered

on rotation by the free service of the two coin carts. Staff are on hand to provide assistance and users can choose to exchange their spare coins for banknotes or adding value to their transit cards known as Octopus. A donation box is also placed inside each vehicle. Since its inception to the end of 2015, the two coin carts have served 150,000 people and collected 129 million coins with a total face value of HK\$140 million.

The Bank of South Korea in collaboration with commercial banks and the Post, has also initiated a nationwide Coin Exchange Campaign, which was carried out in nearly 20,000 financial institution branches across the nation over the entire month of May in 2014. The initiative resulted in the collection of 313 million coins (worth 43.3 billion won), nearly 34.7% of the total amount of coins issued in 2014. The Bank also provided 390,000 units of small money boxes to support coin-collecting efforts among social service organisations and local governments. The Bank successfully returned around 800 million won worth of collected coins, thereby promoting the circulation of coins.

The Bank of South Korea plans to launch a pilot project whereby consumers can deposit small change left from purchases of goods into their prepaid or mobile cards at convenience stores, discount stores and department stores. The project, if successful, could lower the cost of producing coins, though the outcome of the experiment remains to be seen.

28: *ATM Hardware, Software and Services 2016*, RBR.

CASH CYCLE

5.4. FINANCIAL INCLUSION

Financial inclusion, has become a key policy goal in all developing economies. It has become a critical element of social and economic inclusion, as access to money, savings, credit and the ability to make payments is increasingly necessary to access the most basic needs, including food, clean water, health care, sanitation, energy

and education. Measures to combat financial exclusion often include innovations such as e-banking, branchless banking, agency banking, microfinance and e-money. They contribute nonetheless to make cash more readily available.

Share of population
holding an account at
a financial institution
(% age 15+)

	2011	2014
Indonesia	19.6	35.9
Philippines	26.6	28.1
Thailand	72.7	78.1

Source: World Bank

In Indonesia, financial inclusion programmes rely largely on microfinance institutions (MFIs), which include bank and non-bank organisations. Bank MFIs include rural banks, micro-units of commercial banks and village credit agencies. Non-bank MFIs can be divided into formal and informal institutions. Formal nonbank MFIs consist of cooperatives, pawnshops, and village fund and credit institutions. As of April 2012, there were 36,485 cooperatives, 4,933 pawnshop branches and offices, and 1,351 village fund and credit institutions. This represents more than twice the number of commercial bank branches. Branchless banking using agents is also expanding throughout Indonesia.

In Thailand, the financial sector includes the formal, semi-formal and informal sectors. The formal sector consists of banks, finance companies, nonbank financial institutions, and credit fonciers, as well as state-owned specialised financial institutions (SFIs). In particular, the Village Fund initiative has become one of the largest microcredit programmes in the world and provides credit to rural farmers and poor households in almost all of 80,000 villages across the country. Financial inclusion projects have reduced distance barriers and brought financial services closer to households. Approximately 60% of the population, can access a bank branch and ATM in less than 30 minutes. Most of the remainder take up to one hour and 5% of the population requires up to two hours²⁹.

29: Financial Inclusion in Asia - Country Surveys, 2014 Asian Development Bank Institute
<https://www.adb.org/sites/default/files/publication/159308/adbi-financial-inclusion-asia.pdf>

Sector	Providers	Regulators	N° of institutions	Credit volume
Formal	Commercial banks, finance companies, credit fonciers	Bank of Thailand	36	\$395.5 billion (92.7%)
	Specialised financial institutions	Ministry of Finance	8	
	Non-bank financial institutions	Bank of Thailand	28	
Semi-formal	Cooperatives	Ministry of Agriculture and Cooperatives	13,000	\$29.8 billion (7%)
	Village funds		80,000	
Informal	Self-help	None	28,000	\$1.26 billion (0.3%)
	Community organisations			
	Money lenders			

Source: Tambunlertchai (2014). Compiled from most recent data available in mid-2013 in *Financial Inclusion in Asia - Country Surveys*, 2014 Asian Development Bank Institute

In the Philippines, the government launched a National Strategy for Microfinance as early as 1997, calling for the private sector to promote microfinance. Since then, financial inclusion has become a key policy objective associated with the reduction of poverty and inequality. But the challenge is significant as according to the World Bank, only 28% of the adult population held a bank account in 2014.

As in other markets, alternative financial service providers serve as critical access points in many unbanked areas. These include pawnshops, remittance agents, credit cooperatives, money-changers, and foreign exchange dealers that provide specific financial services. According to 2012 data from the Bangko Sentral ng Pilipinas (BSP), if these FSPs are accounted for, only 13% of the municipalities can be considered technically as

under-served or unserved. A study by Bankable Frontier (BFA 2010) showed that 55% of adults use money transfer facilities for their domestic payments. Similarly, in many unbanked areas, pawnshops have become an important access point for providing auxiliary services like remittances, money changing, and payment services. Another area where the Philippines has made significant headway in promoting inclusion is in mobile banking and mobile payments. At the end of 2013, there were 32 e-money issuers and over 217 million e-money transactions amounting to P348 billion. About 56 rural banks with electronic banking operations were also reported in 2012 from none in 2005. Mobile banking has successfully expanded the financial services network to those traditionally unserved and under-served. Cash-in and cash-out operations rely on agents, pawnshops and money-changers.



6

CONCLUSION & REFERENCES

Overall, cash has been growing in all six countries covered by this research, both in value and in volume.

There are clearly two groups of countries: the first group includes Hong Kong, South Korea, and Singapore and is characterised by a highly banked population, a dense banking infrastructure and mature payment systems; the second group gathers Indonesia, the Philippines and Thailand, emerging economies with a significant share of unbanked people and a limited banking infrastructure.

The key conclusion of this paper is that the first group is more cash intensive than the second, measured in terms of the value of cash in circulation in relation to GDP and more strikingly by the number of banknotes per person. The island states of Hong Kong and Singapore have amongst the highest number of banknotes per person in the world. The second group has experienced significant growth of cash volumes driven essentially by sustained economic growth as well as financial inclusion policies which have had a positive effect on cash demand.



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