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Recent developments in payment systems

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Abstract

Payment, clearing and settlement systems are a core element of the financial infrastructure at the national and international level.

The Committee on Payments and Market Infrastructures (CPMI) periodically publishes reference works on payment, clearing and settlement systems in the CPMI member countries. These reports are widely known as Red Books. The statistics include indicators of retail payment systems and payment instruments, as well as of wholesale systems used among banks. Moreover, they include data on trading platforms, clearing houses and settlement systems for securities, as well as on the systems used to perform cross-border transactions. All data are national data collected by the central banks participating in the exercise.

Keywords: payment systems, clearing, settlement systems, central bank's statistics.

JEL codes: E42; E27

1. Introduction

Payment, clearing and settlement systems (PCSS) are a core element of the financial infrastructure at the national and international level. It is currently undergoing radical changes where the traditional position of banks as payment services providers is seriously challenged by the entrance of new actors[2] following the development of new technologies (the so-called Fintech[3]). There is a growing need for comprehensive statistics that allow the monitoring of these new developments. The BIS statistics on PCSS contribute to this monitoring.

2. Section 2 The Committee on Payments and Market Infrastructures (CPMI)[4]

Promoting monetary and financial stability is a key objective of the BIS. Bimonthly meetings of the Governors and other senior officials of the BIS member central banks are instrumental in pursuing this objective. In addition, the standing committees located at the BIS support central banks and authorities in charge of financial stability, by providing background analysis and policy recommendations.

The CPMI is one of the Basel-based committees. Vibrant part of the so-called Basel process, which refers to the active cooperation among committees and the BIS, the CPMI promotes the safety and efficiency of payment, clearing, settlement and related arrangements, thereby supporting financial stability and the wider economy. It monitors and analyses developments in these arrangements, both within and across jurisdictions. In addition, it serves as a forum for central bank cooperation in related

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[2] Committee on Payments and Markets Infrastructure (2014).
[3] See PricewaterhouseCoopers (2016).
[4] The Committee on Payment and Settlement Systems (CPSS) established in 1990 by the G10 Governors was renamed "Committee on Payments and Market Infrastructures" in September 2014.

oversight, policy and operational matters, including the provision of central bank services. The CPMI is a global standard setter in this area. It aims at strengthening regulation, policy and practices regarding such arrangements worldwide. It cooperates with other standard setters (in particular the International Organization of Securities Commissions and the Basel Committee on Banking Supervision), other central bank bodies (such as the Committee on the Global Financial System), international financial institutions (such as the International Organization of Securities Commissions) and public sector bodies on matters falling within its mandate to enhance coordination of policy development and implementation.

3. Section 3 The CPMI Red Book and other payment statistics publications

The CPMI periodically publishes reference works on PCSS in the CPMI member countries [5]. These reports are widely known as Red Books. The Red Book on PCSS in the CPMI member countries was published for the first time in February 1980 with the title "Payment systems in eleven developed countries".

The Red Book is periodically revised. Following the enlargement of the then CPSS from 14 to 24 countries in 2009, the Red Book is now issued in two volumes: the first covers 10 member countries (Australia, Brazil, Canada, India, Korea, Mexico, Russia, Singapore, Sweden and Switzerland). The second volume covers the remaining 13 member countries (Belgium, China, France, Germany, Hong Kong SAR, Italy, Japan, the Netherlands, Saudi Arabia, South Africa, Turkey, the United Kingdom and the United States) and the euro area and includes a chapter on international arrangements.

The Red Book is not the only international statistical publication to deal with PCSS. Several other international organisations regularly published in various colours "regional" reports on PCSS in their jurisdictions:

- The Centro de Estudios Monetarios Latino Americanos (CEMLA) and the World Bank publishes a "Yellow Book";
- The Commonwealth of Independent States Payment and Securities Settlement Initiative distributes a "Silver Book" under the auspices of the World Bank;
- The European Central Bank issues a "Blue Book";
- The Executives' Meeting of East Asia Pacific Central Banks (EMEAP) circulates an "EMEAP Red Book";
- The Southern Africa Development Community (SADC) produces a "Green Book".

The World Bank has organised its Global Payment Systems Survey in 2007, 2010, 2012 and 2015[6] with a coverage of 84 countries in the last edition.

In addition, several countries, in cooperation with the CPMI, have also published Red Books on payments and market infrastructures in their national territory.

4. Section 4 The content of the CPMI Red Book

The Red Book is an annual publication that provides data on PCSS collected by the central banks of the CPMI countries.

The statistics include data on settlement media used by banks and non-banks, indicators of retail payment instruments (i.e. payment cards and terminals), as well as of wholesale systems used among banks (i.e. interbank funds transfer systems (IFTS) and SWIFT). Also included are data on securities and derivatives trading platforms, central counterparties (CCPs), clearing houses and settlement systems, as well as on the systems used to perform cross-border transactions. A preliminary version is

[5] The CPMI members are the Reserve Bank of Australia, the National Bank of Belgium, the Central Bank of Brazil, the Bank of Canada, The People's Bank of China, the European Central Bank, the Bank of France, the Deutsche Bundesbank, the Hong Kong Monetary Authority, the Reserve Bank of India, the Bank of Italy, the Bank of Japan, the Bank of Korea, the Bank of Mexico, the Netherlands Bank, the Central Bank of the Russian Federation, the Saudi Arabian Monetary Agency, the Monetary Authority of Singapore, the South African Reserve Bank, the Sveriges Riksbank, the Swiss National Bank, the Central Bank of the Republic of Turkey, the Bank of England, the Board of Governors of the Federal Reserve System and the Federal Reserve Bank of New York.

[6] World Bank (2016)

published a few months before the definitive version. Basic macroeconomic data are also provided for the calculation of ratios available in the comparative tables.
One of the interesting characteristics of the Red Book data set is the length of the time series it contains. Each version of the Red Book displays data covering the past five years, but annual data starting in 1987 are available in earlier editions of the Red Book published in pdf format on the BIS website. Upon request, the BIS provides data starting from 2000 in electronically downloadable format. The BIS plans to eventually disseminate the whole data set in Excel format on its BIS website.
A second interesting characteristic of the Red Book statistics is the availability of comparative tables. Comparing payment statistics across countries is usually not very easy in the absence of international statistical standards specific to the payment domain. Moreover, very often countries have developed national payment settlement systems without coordination with other countries. This has hindered the compilation of internationally harmonised statistics on payment systems. The fast changes in the payment industry has further complicated this compilation work. Therefore the Red Book provides, in addition to the country tables, a number of ready-to-use derived tables (expressed in percentage points of GDP, growth rates and per inhabitant) which compare indicators across countries. The basic macroeconomic data used in the calculation of ratios published in the comparative tables are provided in the country tables
In addition, qualitative information is available on a cross-country basis on interbank funds transfer systems, exchanges and trading systems, central counterparties, clearing houses and central securities depositories. As it is not possible to summarise the characteristics of these systems by country, a selection of the main national systems is provided with individual qualitative information.

5. Section 5 Some examples of CPMI Red Book data uses

The comparative tables of the Red Book provide a cross-country comparison of the amounts of currency in circulation outside banks expressed in percentage points of GDP (see Graph 1)
With the structural changes that the payment industry has undergone over the last a few years, one would expect that the demand for cash has weakened. It is very surprising to see that almost everywhere, the demand for cash has somewhat increased since the Great Financial Crisis (GFC) despite rapid developments of cashless payment technologies. This currency growth is probably the result of the sharp decrease in interest rates globally, which has accordingly reduced the opportunity cost of cash retention.
One would expect the level of currency issued in advanced economies (AEs) to be generally lower than in emerging market economies (EMEs) where the population usually relies more on cash. But it is not the case, mainly because of the strong preference Japanese households have for using cash, which is reinforced by a lack of check writing tradition. [7] As a result, the demand for cash in AEs is almost as high as in EMEs.
Sweden stands clearly apart from other AEs. Segendorf and Wretman[8] have described the changes in payment requirements of Swedish households and the emergence of new institutional players which strongly compete with banks on the Swedish payment market. As a result, the currency expressed in percent of GDP has declined continuously since 2001. The latest observation obtained outside the Red Book survey indicates that the trend is continuing in 2017 and cash has further decreased in Sweden by 20% since the last survey.

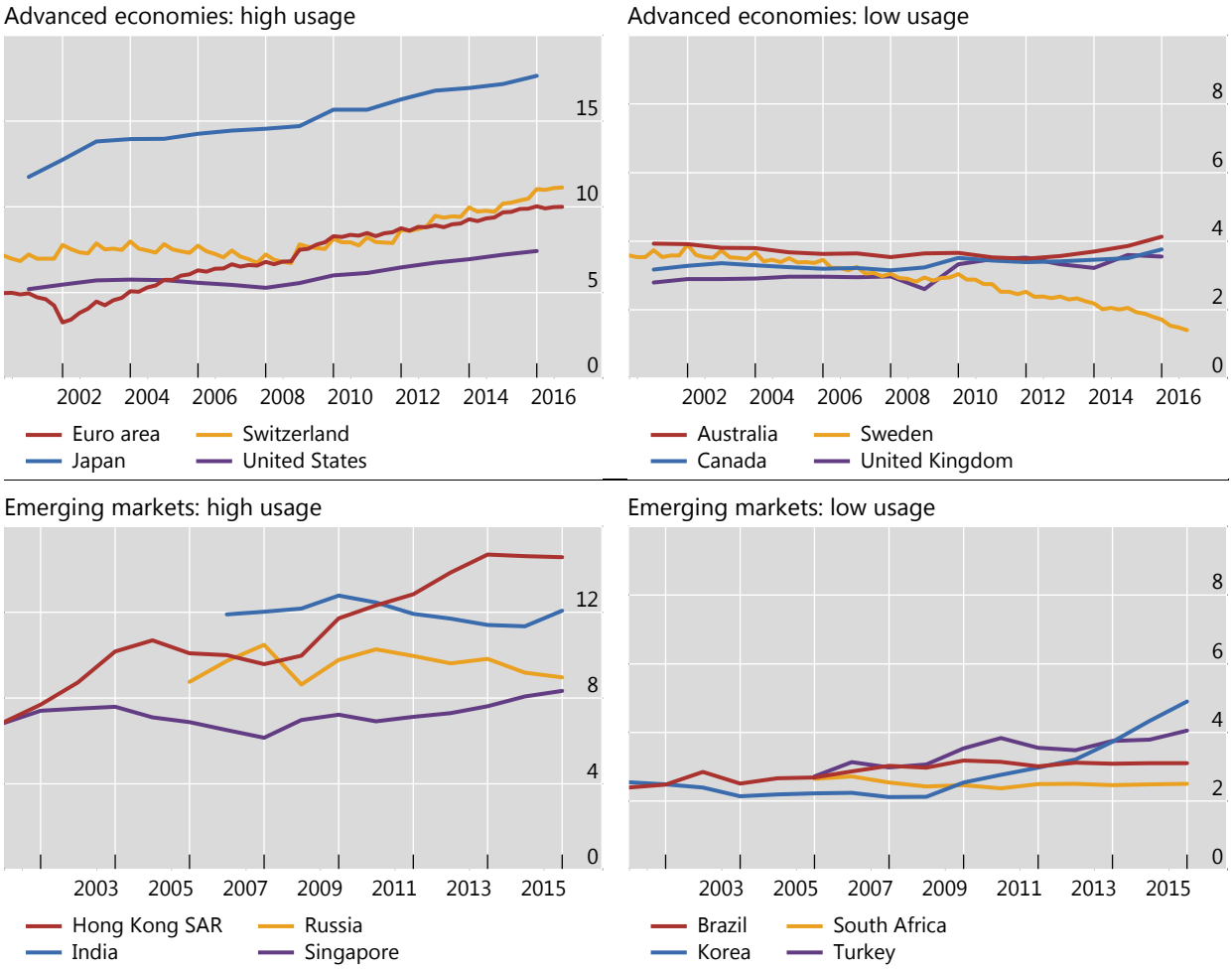
[7] See Japanese Bankers Association (2012).
[8] See Segendorf and Wretman (2015).

Among EMEs, currency usage is quite high in Hong Kong, India, Russia and Singapore. Hong Kong residents have substantially increased the currency usage since the GFC from 10 to 15 percentage points of GDP. Other EMEs, like South Africa and Brazil, have a very low currency usage (below 3 p.c. points of GDP), like Korea before the GFC. Since then, the Korean demand for currency has increased to 5 p.c. points of GDP.

It should be noted that the observed cash usage, as defined as the ratio between currency and GDP, could sometimes be blurred by the fact that some currencies are used outside their national territory. The cash usage is indeed very high in some countries like Japan, the United States and Switzerland where advanced payment technologies are available. The reserve status of their currencies might generate external usage by non-residents, which could partially explain the high ratios observed.

Currency in circulation outside banks

As a percentage of GDP — Graph 1



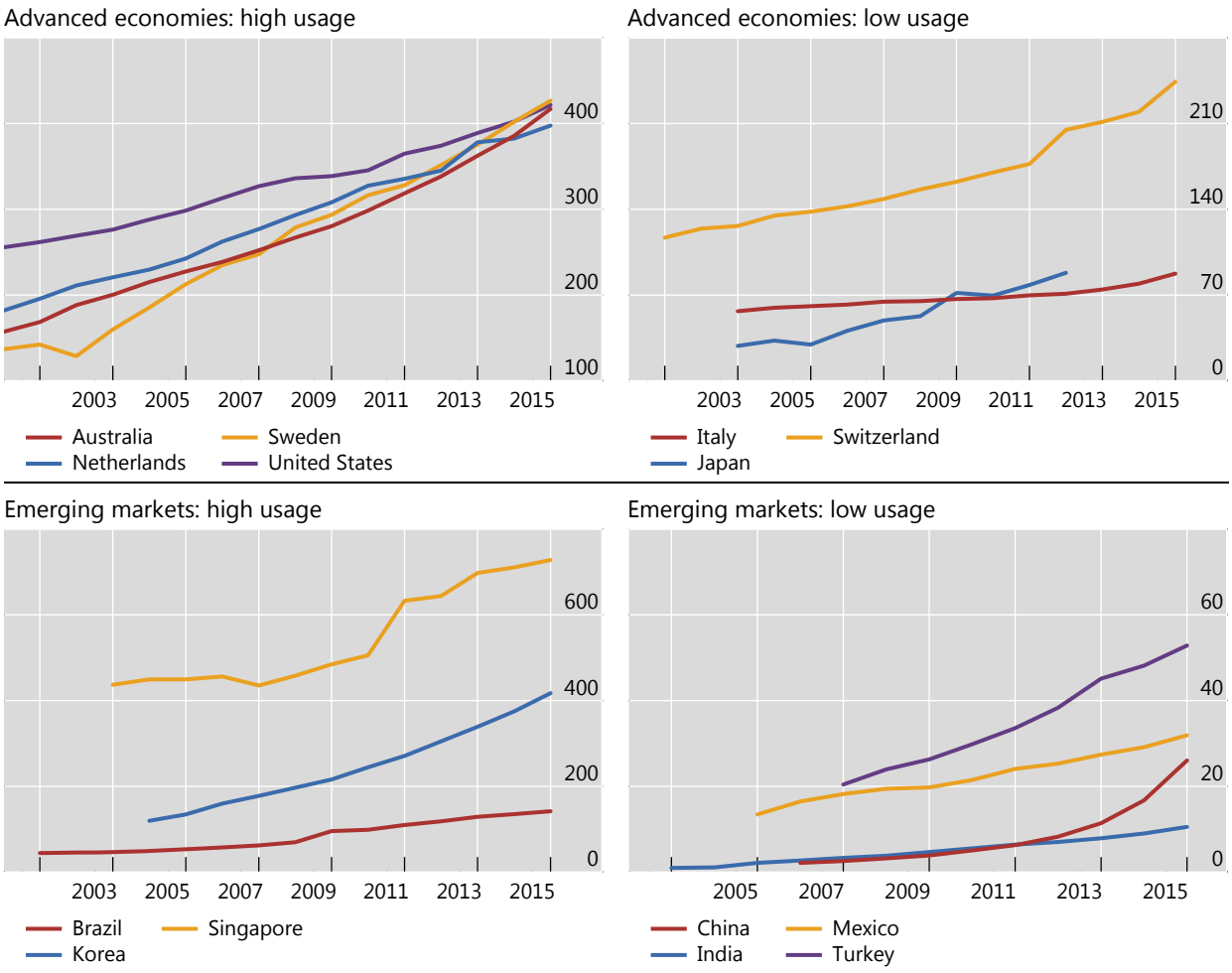
Source: BIS statistics on payment, clearing and settlement systems in the CPMI countries.

Even if the currency usage has increased since the GFC, there is no doubt that electronic payments are safer, faster and more efficient than cash payments and should in the medium run diminish cash usage.

Graph 2 shows the number of transactions with cashless payment instruments per inhabitant. The number of cashless transactions seems to have at least doubled over the last 10 years across all countries. The most "cashless payment-intensive" country is Singapore. In terms of number of cashless operations per inhabitant, this country has been ahead of the CPMI countries since 2002. The other electronic payment-intensive countries are AEs like Australia, the Netherlands, Sweden and, for several years, the United States. In 10 years, the first three countries increased the number of cashless transactions from less 200 a year per person to more than 400. Their developments have been remarkably similar.
Less electronic payment-oriented AEs are Italy and Japan with less than 100 cashless operations a year. We have seen in Graph 1 that Switzerland is characterised by intensive cash usage; therefore it is not surprising to see that the threshold of 200 operations a year has only been recently overtaken.
Besides Singapore, it is in Korea that the number of cashless payments is growing the fastest in EMEs. In China, the number of cashless operations is growing fast, albeit from a very low level.

Cashless payment transactions by non-banks: total number of transactions

Number per inhabitant — Graph 2



Source: BIS statistics on payment, clearing and settlement systems in the CPMI countries.

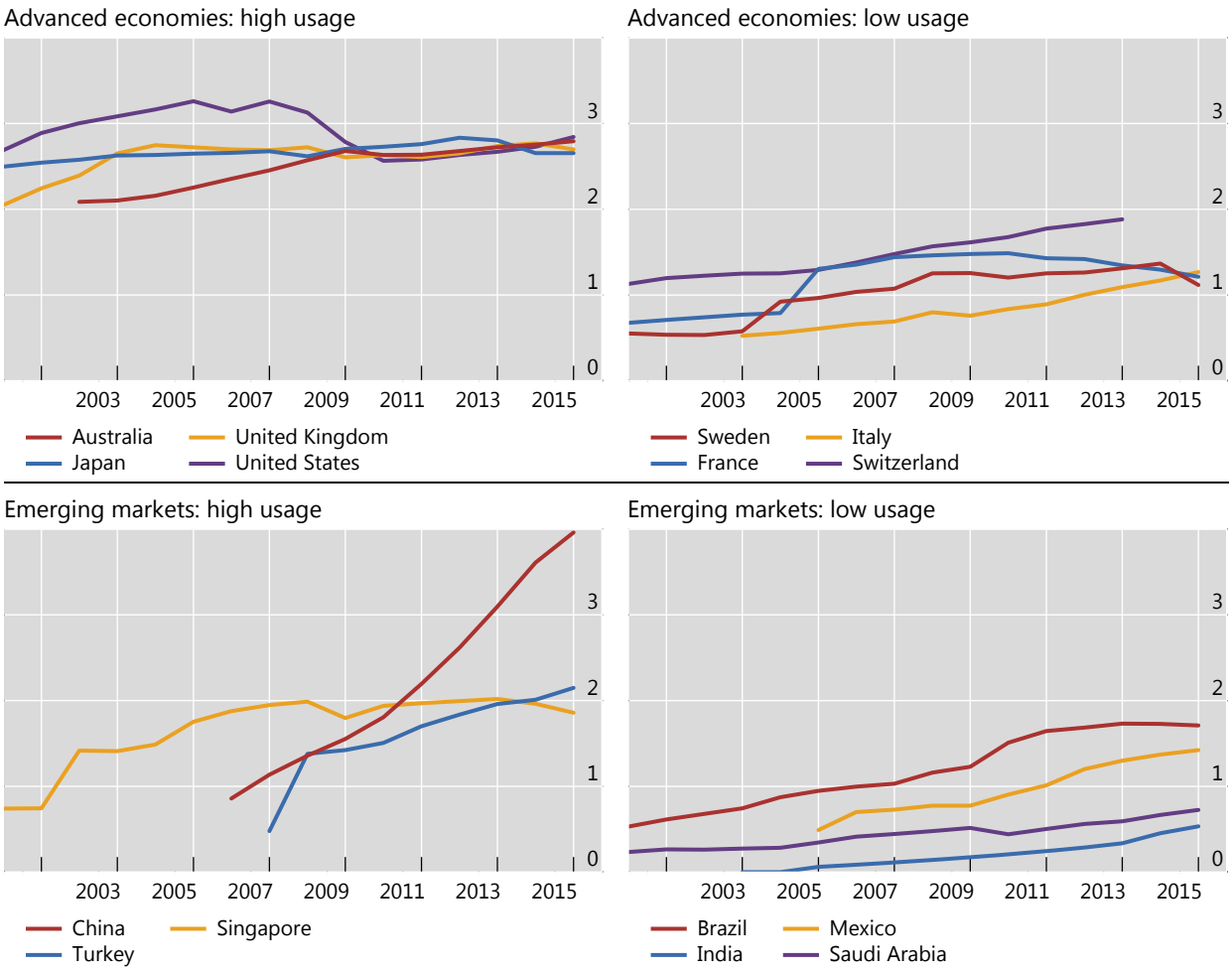
Credit or debit cards are the most frequently used cashless instruments. Graph 3 shows that Chinese residents hold the highest number of payment cards per capita: on average almost four cards. This is an exception in the EMEs, where even in large card-holder countries, like Turkey and Singapore, residents hold an average of 2 cards.

From Graph 2 we know that Chinese residents hardly use the cards they hold. Nevertheless they still seem to continue to increase their number. This is rather unique as in all the other countries, the number of cards held is rather stable, with the exception of catching-up countries like India, Saudi Arabia and Mexico.

In AEs, residents nowadays do not hold more than 3 cards: on average, residents of Australia, Japan, the UK and the US hold 2.8 cards each. At the other end of the spectrum, Swedish residents hold hardly more than one card, but we have seen in Graph 2 that they use it intensively. There is obviously no link between the number of cards held and the number of electronic payments made

Cards issued in the country

Number per inhabitant — Graph 3



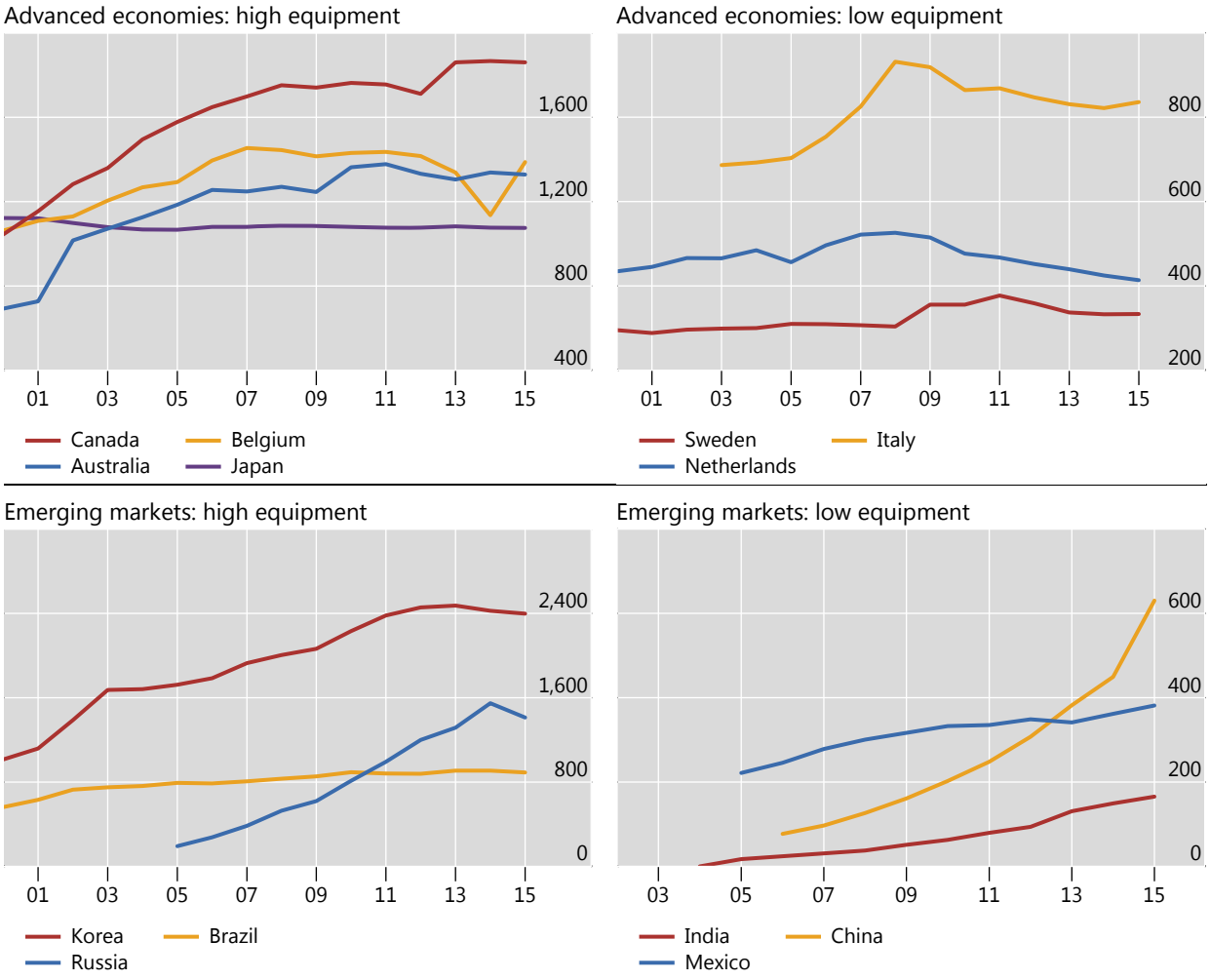
Source: BIS statistics on payment, clearing and settlement systems in the CPMI countries.

The Red Book data set also provides information on the supply side of the payment market, i.e. the number of machines which can provide payment services to consumers. Graph 4 shows the number of automated teller machines (ATMs) per million inhabitants and Graph 5 the number of points of sale (POS) per billions of inhabitants.

The densest ATM networks in the world are located in Korea and Canada with around 2 terminals per thousand inhabitants. The network of ATMs is usually stable in the CPMI countries with the exception of the two countries mentioned above which continue to extend their network. Russia has the second largest ATM network in the EMEs after Korea and continues to develop it. This is required by consumers as cash remains the leading payment instrument in the country.[9] Among the low equipped countries, China is reducing its gap and in seven years has multiplied the density of its ATM network by 6.

Terminals located in the country: total number of ATMs

Number of terminals per million inhabitants — Graph 4



Source: BIS statistics on payment, clearing and settlement systems in the CPMI countries.

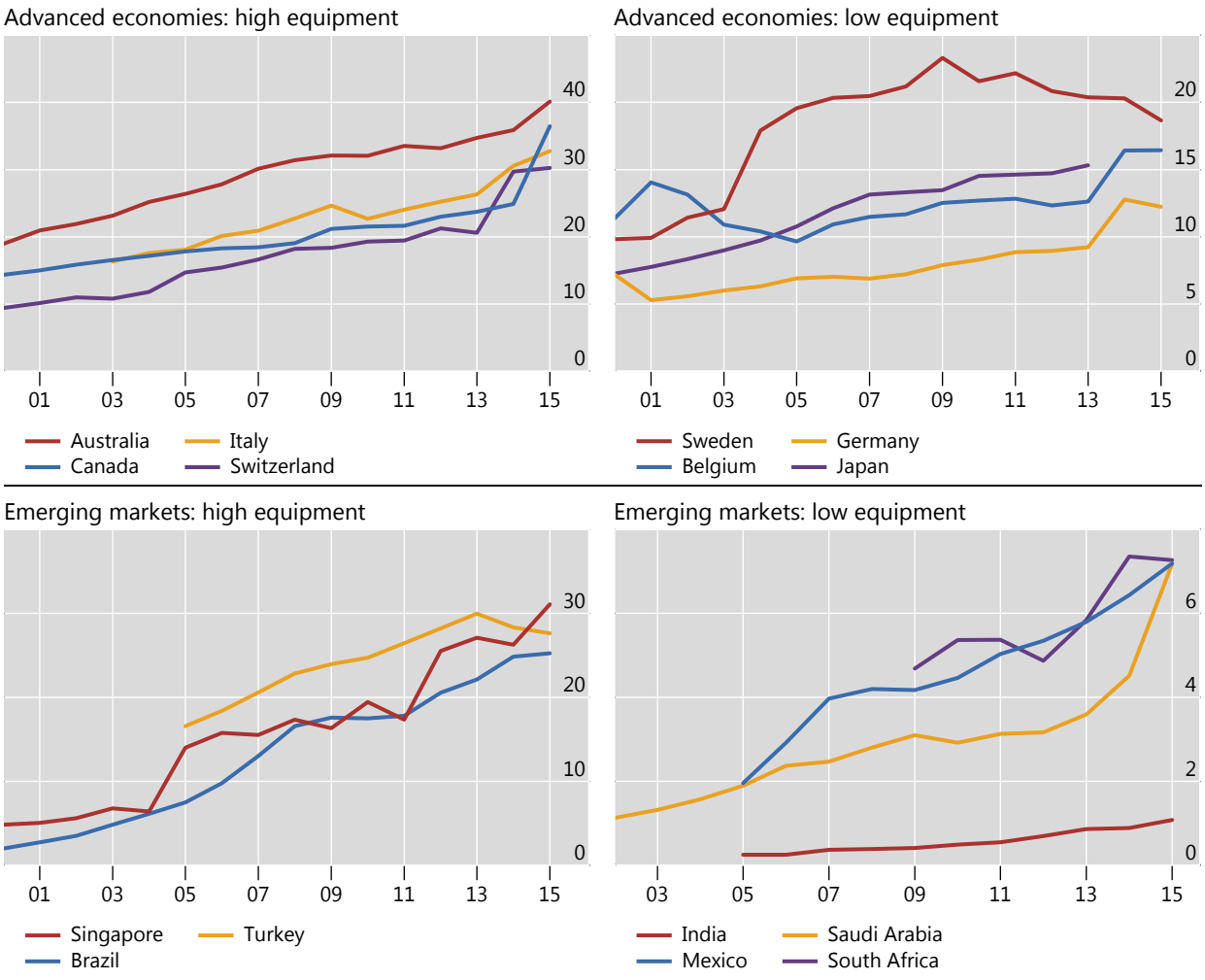
[9] Hugo-Webb, T (2013).

The POS network is in general twenty times tighter than the ATM one. The highest concentration of POS can be observed in Australia and, since 2005, in Canada. Compared to other payment instruments or terminals, Italy has a well developed POS network. This is less the case for countries like Belgium and Germany.

POS networks are usually less developed in EMEs but the Singaporean network is growing fast and has already reached the level of the largest AEs' networks. The POS equipment of several EMEs is however very limited and will require several years of large investments before they reach the average of the AEs.

Terminals located in the country: total number of POS terminals

Number of terminals per billion inhabitants — Graph 5



Source: BIS statistics on payment, clearing and settlement systems in the CPMI countries.

Further analyses of the number of transactions at terminals (ATMs and POS) and the transaction amounts as well as cross-border operations are possible with the Red Book statistics.

6. Conclusion

This paper has reviewed the role of the CPMI and the statistical information the Red Book it makes available to the public. Besides the richness of the qualitative information it offers on payment systems,

the Red Book provides a lot of statistical information. The interesting aspect of these statistics is the length of the covered period which starts in 2000. This allows monitoring of the developments of and changes in the payment and settlement systems across countries over 15 years.

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