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# Central Bank Reserves Management
## Currency Composition of Foreign Currency Reserves



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In our fifth whitepaper, we delve into the attributes of a reserve currency from a historical perspective and consider the forces at play in the 21st century. The paper considers these questions within a broader framework of what attributes are required of a country for its currency to be accepted as major reserve currency. And, at a more micro level, what are the policy considerations that drive the optimal currency composition at the level of an individual central bank. Within this context, the paper assesses the role of the USD as a store of value in foreign currency reserves and as a means of exchange for international trade. We suggest reasons why its dominance in both arenas is likely to continue as well as assessing the nature and viability of current challenges to its dominance from major trading countries seeking greater political autonomy.

# Central Bank Reserves Management
## Currency Composition of Foreign Currency Reserves



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## Abstract

This White Paper delves into the attributes of a reserve currency from a historical perspective and considers the forces at play in the 21st century as China challenges the US for global economic leadership and major trading countries seek to develop alternatives to the USD in the sphere of global payments. The paper considers these questions within a broader framework of what attributes are required of a country for its currency to be accepted as major reserve currency. And, at a more micro level, what are the policy considerations that drive the optimal currency composition at the level of an individual central bank. Within this context, the paper assesses the role of the USD as a store of value in foreign currency reserves and as a means of exchange for international trade. We suggest reasons why its dominance in both arenas is likely to continue as well as assessing the nature and viability of current challenges to its dominance from major trading countries seeking greater political autonomy.

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# 1. Currencies and gold as reserve assets

The current system of holding fiat currencies as foreign exchange reserves is relatively new. Over millennia, gold and silver had served both as a means of settlement of international trade and as store of value. In the latter half of the 19th century, foreign currencies began to replace gold for payments and reserves for reasons of convenience as international trade and capital flows blossomed under the British Empire and the actual movement of gold was cumbersome. The British pound dominated foreign currency reserves reflecting its global military, technological and economic leadership but countries held also substantial shares of currencies of other global trading countries including France, Germany and the US. It is worth noting that the GBP retained its dominant share of global reserves until the mid-1950's long after the US had become the world's leader in technology and its largest economy, partly due to the leading international role of UK banks as well as US regulations which constrained the growth of its national banks.[1]

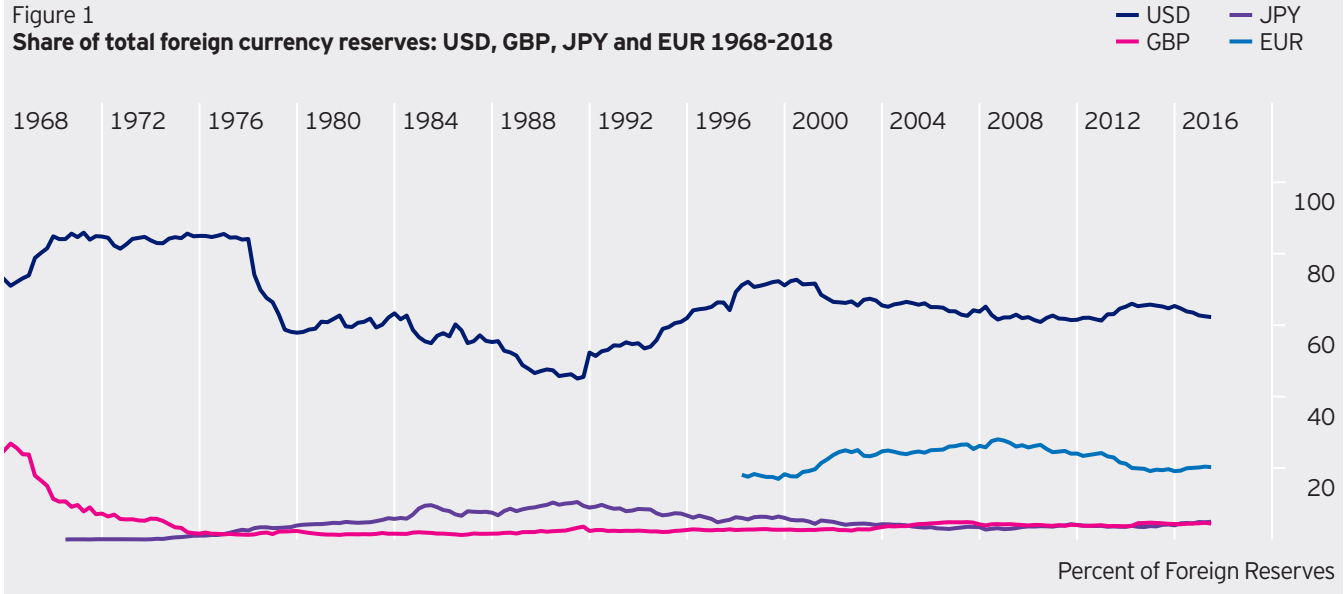
Until 1971, foreign currency reserves represented a claim on the gold of the country of issue at a fixed price. With the depletion of countries' gold holdings during WWII, the US was the only country with sufficient gold to back its currency. Under the Bretton Woods system, the USD was fixed to gold at the price of $33/oz and other countries fixed their exchange rates to the USD. In 1971, this system collapsed when President Nixon severed the link of the USD to gold. This was only the last in many breakdowns of the use of gold in domestic and international monetary arrangements, which mainly recurred when domestic economic imperatives conflicted with maintaining a fixed exchange rate in line with the commodity reserve backing the base money supply.

In 1971, the system of foreign exchange reserves underwent a fundamental shift, the consequences of which are only fully being realized in the 21st century. Countries found themselves in the position of accepting fiat currencies as a store of value for their national savings, with the value dependent on the strength of the economy and central bank of the issuing country. Over the remainder of the 21st century, central banks accepted USD assets as reserves as the US was at the cutting edge of technological innovation with positive consequences for economic growth, military dominance, political stability and continuity in its support for open trade and capital markets. It is also interesting to note that Germany actively discouraged the use of its currency for reserves through capital controls out of concerns for its monetary policy autonomy.

The system of holding fiat currencies as reserves implies that currency composition is now an investment decision rather than a residual of countries' balance of payments dynamics. This is evident in the adjustments to the holdings of currency following economic crises associated with the country of issue. Figure 1 illustrates the final decline of the GBP as a major reserve currency following the devaluation of the pound in 1967; the rise of the JPY as a reserve currency and subsequent decline following the collapse of the Japanese valuation bubble in 1990; and, the growing share of the EUR after its introduction in 1999 and subsequent decline following the EUR debt crisis of 2012 and questions around the cohesiveness of the Eurocurrency zone.

Before considering the choice of currency to be held as reserves, it is important to reflect on the principal objectives for holding reserves as the relatively importance of these objectives will determine the optimal currency composition at an individual country level. Most central banks define their principal policy objective for reserves as: (i) implementing exchange rate policy; (ii) as a store of value for future uncertainties; and, (iii) to give confidence to foreign creditors. These policy objectives broadly translate into the investment objectives of capital preservation, liquidity and return. Until the turn of the 21st century, the first objective took precedence under a global system of mainly fixed rates. Central banks required liquidity to intervene in the markets to defend the currency peg, whether to the USD, the European Rate Mechanism (ERM) or the Special Drawing Right (SDR) basket. The system of fixed exchange rates proved unsustainable, however, when governments sought to maintain pegs inconsistent with the underlying economic fundamentals and over time, floating or managed rate systems have replaced most fixed rate currency regimes. As a consequence, reserve drawdowns have declined in frequency and severity and reserves have become more relevant for financial stability purposes rather than direct exchange rate management. Reflecting this shift in international monetary arrangements, many central bank reserves managers shifted from pure liquidity management to a portfolio management approach with increased emphasis on capital preservation and return. This has been accompanied by greater diversification in currency holdings as well as asset classes, as discussed in earlier White Papers.[2]

Figure 1
**Share of total foreign currency reserves: USD, GBP, JPY and EUR 1968-2018**




Source: IMF, Bloomberg, reported in USD and unadjusted for exchange rate movements. Data as at 30 June 2018.

## 2. Criteria for acceptance of a currency for reserves

The currency of the global leader in terms of international trade, technology, capital markets and military capability dominates international settlements and foreign currency reserves. A country can either promote or discourage the use of its currency for reserves but history shows that it is easier for a government to discourage its use rather than promote it through advocacy. The acceptance of a currency or commodity as a global reserve depends on the country's balance of payments dynamics, capital market liquidity, and political stability and predictability, as discussed in more detail below.

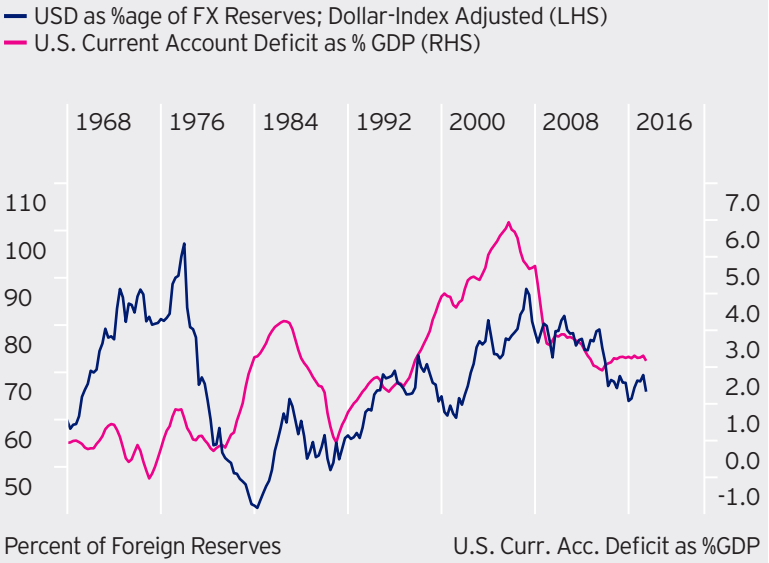
For the currency to be held by central banks, the issuing country needs to provide currency to the rest of the world either through imports of goods and services or export of capital. It sometimes seems – especially nowadays – that an issuing country would need to run a current account deficit, but capital account outflows also work to lubricate growth in world trade and capital flows. As illustrated in Figure 2, the US ran a current account surplus until the early 1980's as the USD share of currency reserves (excluding gold) increased from 60% to nearly 100% in 1978. From 2000, onwards, the burgeoning US large current account deficits fuelled the growth in global reserves, of which the USD maintained its share as net exporters purchased USD to avoid appreciation of their currencies.

While China now leads the world in international trade flows, the USD is still used globally to invoice and settle trade including between third countries where the US is not a party, contributing to continued dollar dominance in reserves. The US represents 14% and 18% of global exports and imports, respectively[3] but about half of all international trade payments over SWIFT are denominated in USD.. The decision of which currency to use for invoicing or payments is ultimately made by micro-economic players for whom there are benefits in using a single currency for pricing both across comparable goods and along the supply chain. These externalities explain the "stickiness" of the use of the USD for payments despite pressure by governments to develop alternatives in the face of the US use of its currency to impose US laws on an extraterritorial basis.

As liquidity is still a paramount objective for reserves managers, the depth and quality of a country's fixed income markets is key to its acceptability as a reserve. Depth is indicated by both market capitalization and daily turnover, a better indicator of actual tradable volumes. Quality refers to the transparency and integrity of issuer information, the integrity of issuer ratings and the market infrastructure required to support liquidity.

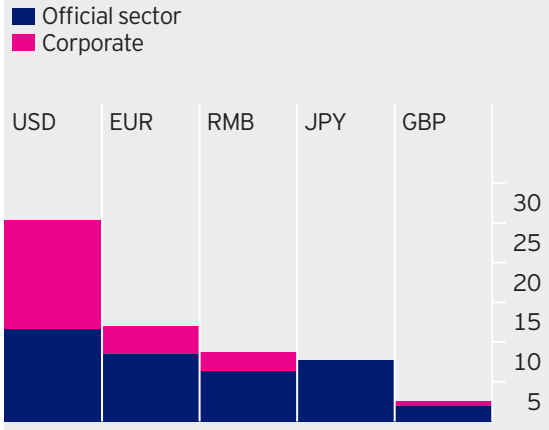
The strength and depth of US capital markets explains to a great extent the persistence of the USD in reserve holdings. Given its depth, the USD is well bid during financial crises, even when the crisis has originated in the US financial sector, as was the case in 2007-08. In addition, the sheer size of global foreign currency reserves excludes smaller countries from any meaningful role as a reserve currency. On aggregate, foreign currency reserves invested in financial assets exceeded $11 tn in 2018 and the top 25 central banks in terms of reserves each hold over $100 bn.[4] For central banks with large foreign currency reserves, only the US, EUR, JPY and potentially the on-shore RMB market offer sufficient depth and liquidity as can be seen by the relative size of fixed income markets and their liquidity, as illustrated in Figures 3 and 4.

Figure 2
**U.S. Dollar's Share in Global Currency Reserves (adjusted for currency effects) and the USD Current Account Balance (%GDP)**




Source: COFER, Bloomberg, Authors' Calculation. Data as at 30 June 2018. Note: The currency shares are adjusted for exchange rate movements using the Dollar Index (DXY) maintained and published by Intercontinental Exchange, Inc. The COFER series, which started in 1994, excludes "unallocated reserves".

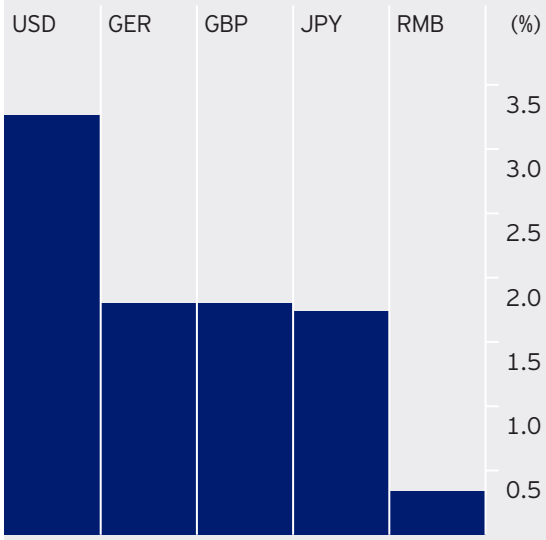
Figure 3
**Market Capitalization of Reserve Currency Fixed Income Markets (USD tn)**




Sources: Bloomberg, AsDB--Asia Bond Online. Data as at 31 December 2017. Note: "Official sector" includes bonds issued by governments and broadly, government supported institutions or those not purely perceived as private sector. In the US, Treasury, municipalities and the GSEs are included under the official sector. In China, Treasury, Local Government and Policy Banks are included. The corporate sector includes private financial and non-financial sectors.

While the RMB on-shore bond market is the third largest in terms of market capitalization, it is still less liquid as indicated by the substantially lower average daily turnover rates as seen in Figure 4 due primarily to the large relative holdings of onshore bonds by domestic commercial banks in their investment portfolios.

Figure 4
**Government bond liquidity in reserve currencies**
Average Daily Turnover (average daily trading volume/bonds outstanding)



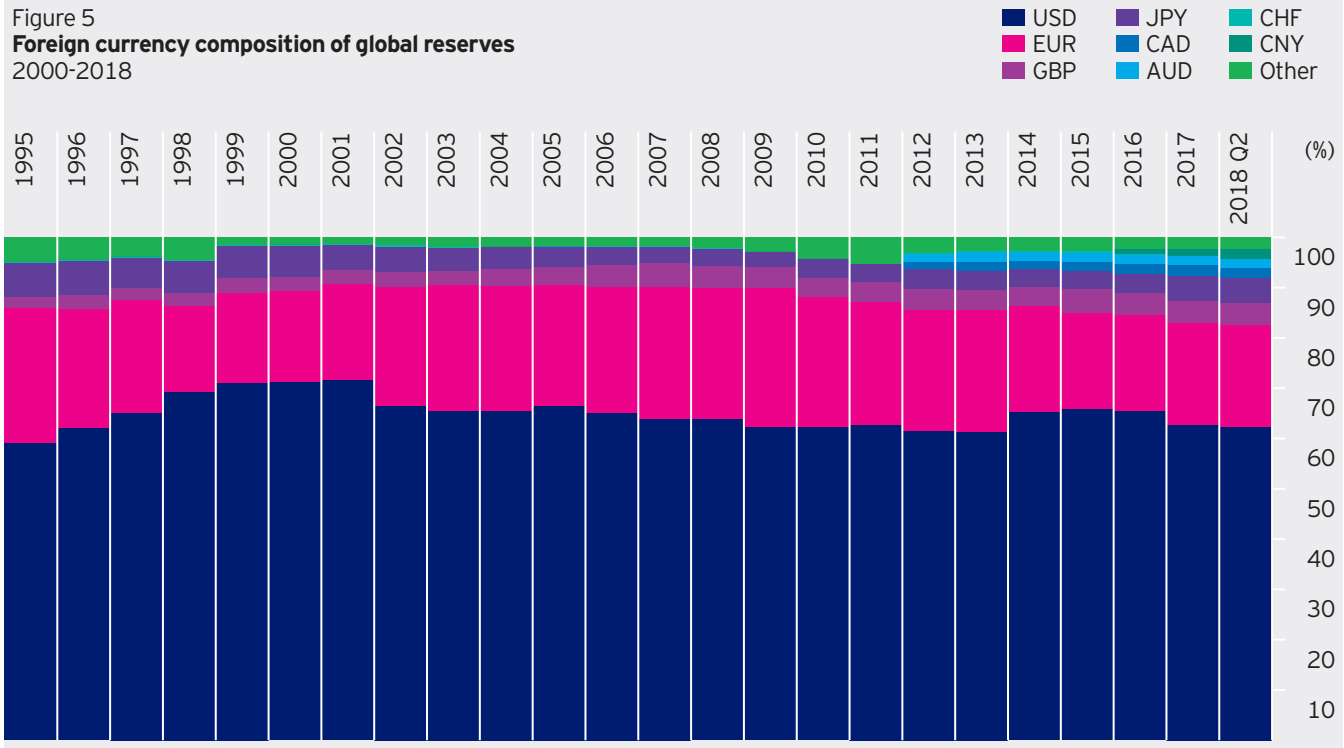

Sources: Sifma, Afme, AsDB Asian Bonds Online.
Data as at 31 December 2017.

In addition to market depth, institutional stability and developed market structures support the stability of prices, usability and tradability of reserve currency assets, especially at times of market pressure or outright crisis, when international reserves would have to be sold to maintain domestic financial and economic stability. Stability and predictability are associated with: (i) open markets where participants establish prices based on transparent, comprehensive and credible information regarding the quality of the issuer, the state of the economy and the financial system; (ii) stable government with credible policies and institutions of economic and financial management; and, (iii) the rule of law.

A fiat reserve currency is backed not by gold or other reserves, but by the policy credibility of the central bank or monetary authority that stands behind the currency and the resources and creditworthiness of the state that issues the reserve assets. While moderate inflation or other macro risk premia are not disqualifiers for a reserve currency, credit risk is generally a severe constraint – a core issue that goes to the heart of the purpose of reserves. Macroeconomic factors – such as growth or inflation risk premia, if moderate – are actually part and parcel of the normal evolution of economic cycles, whereas major and sudden shifts in such risk premia are a symptom of boom/bust cycles and make a currency less acceptable for reserves.

The importance of financial stability is evident in the moderate realignments of reserves following The Great Financial Crisis when the share of USD reserves declined from 2008-2013 and central banks also became net buyers of gold. However, in short order, the Eurozone financial crisis of 2012-13 tested the integrity of the Euro itself and the creditworthiness of several Eurozone sovereigns, some of which were held as reserves, resulting in realignment from EUR back to USD assets.

Figure 5
**Foreign currency composition of global reserves**
2000-2018




Source: COFERS. Data as at 30 June 2018.

## 3. Currency composition as a policy choice

Increasingly, the foreign currency composition of reserves is a policy choice, which becomes evident at a country rather than an aggregate level. Central banks of economies highly integrated with the Euro-zone tend to hold upwards of 80% of reserves in EUR whereas Latin and Central American countries typically tend invest mainly in USD. Central banks in advanced economies, where the main objective of reserves is to support the financial sector, tend to overweight currencies that are countercyclical during crisis periods, "safe haven assets." And currencies of regional economic hubs such as South Korea, India, Brazil and South Africa may be included in the reserves of neighbouring countries and trade partners.

The policy factors driving the optimal currency mix for a given country include the legal framework, level of economic development, exchange rate regime, level of reserves and, for emerging market countries, reserves adequacy. Figure 6 provides a synopsis of how the mix of these factors will lead to a different solution for the optimal currency mix at the level of the country and central bank.

In Figure 6, the objective for defining the optimal currency composition is risk minimization across different risk frameworks. Alternatively, central banks with ample reserves may seek to maximize risk-adjusted returns, thereby increasing reserves through internal investment return and enhancing government revenues over time. In this instance, central banks would tend to diversify across currencies as well as across asset classes. For all emerging and developing market countries, foreign currency is a major risk to central bank capital in local currency terms but it cannot be hedged as the reserves are held as "backing" of the foreign currency liabilities and potential outflows at a country level rather than the level of the central bank balance sheet. This is not the case for advanced economy central banks, some of which do hedge the foreign currency risk.

Central banks can and do separate currency risk and country credit risk. Central banks in the Eurozone may hold USD assets but sell USD forward to minimize foreign currency risk to central bank capital. In regional trading blocks, neighbouring central banks may elect to hold the currency of the regional economic hub to maintain purchasing power vis a vis its imports.

If the regional hub does not meet minimum credit rating criteria, the central banks may invest in more highly rated multi-lateral bank bond issues in that currency. Currency swaps are another off-balance sheet mechanism for accessing foreign currency during crisis periods without incurring balance sheet exposure to the currency. The Federal Reserve Bank New York offered over $30bn USD swap lines to six central banks during the global financial crisis.

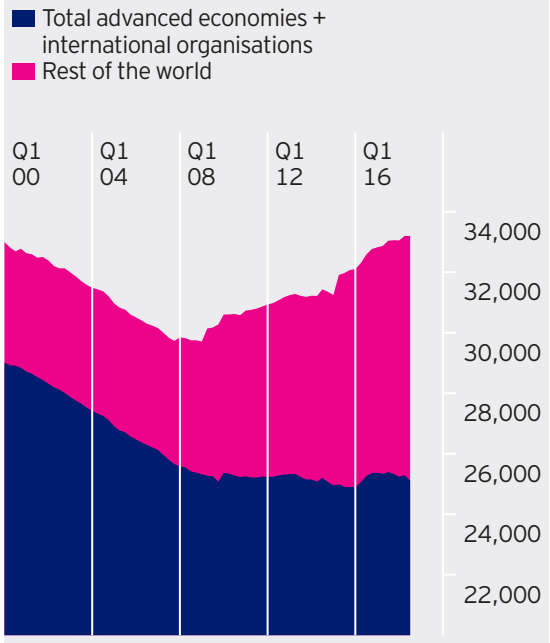
The policy choice of reserve holdings is also influenced by geo-politics. The Central Bank of Russia in 2018 undertook a major realignment of reserves away from the USD in response to US government sanctions imposed upon Russian individuals. Following the withdrawal of the US from the Iran agreement in 2018, both the European Commission and the German government have undertaken deliberations to promote the EUR as a settlement and invoice currency for the imports of oil into Europe. The upturn in central bank purchases of gold may also reflect concerns over US global leadership and its use of the USD to impose its laws on an extraterritorial basis. Since the GFC, emerging and developing economies have doubled their holdings of gold while advanced economies continued to be net sellers, albeit at a much lower rate than prior to the GFC. In 2018, the rate of increase of net purchases of gold spiked to its highest level in three years with China, Russia, Poland, Hungary, Kazakhstan, and Mongolia all reporting substantial increases.

Figure 6
**Policy frameworks and determinants of currency composition at the country level**

| Legal ownership of reserves | Economic Development | Policy Objective | Dominant factors |
|---|---|---|---|
| Government | Advanced | Minimize foreign currency risk at the government level | Currency composition of government foreign currency borrowings |
| Central bank | Advanced and large financial sectors | Liquidity provision to the financial sector during crisis | Capital market depth; countercyclical assets |
| Currency union | Advanced-national central banks | Minimize foreign currency risk to central bank capital | Currency composition of central bank liabilities |
| Central bank | Emerging | Minimize foreign currency risk of reserve adequacy measures | Foreign currency debt of the government, financial sector and private sectors and potential capital outflows |
| Central bank | Developing | Access to essential imports during crisis periods | Currency of essential imports |

For illustrative purposes only.

Figure 7
**Central bank net purchases of monetary gold (tonnes)**




Source: IMF. Data as at 30 September 2018.

## 4. Incorporating macroeconomic risk factors into currency composition

Broadly speaking, reserves serve as a prudential portfolio to tide countries over during periods of stress. From a policy perspective, it thus makes sense to assess whether there exists a relationship between reserve currencies and domestic risk factors. As an illustration, currencies of countries that are dependent on commodities tend to be pro-cyclical with exchange rates positively correlated with commodity prices and global growth. Other currencies tend to appreciate during crisis periods, just when a central bank may need to deploy reserves. Understanding how currencies behave during the economic cycle and in relation to a country's own macro-economic risk factors can help central banks mitigate risk at a country level or at least avoid doubling up.

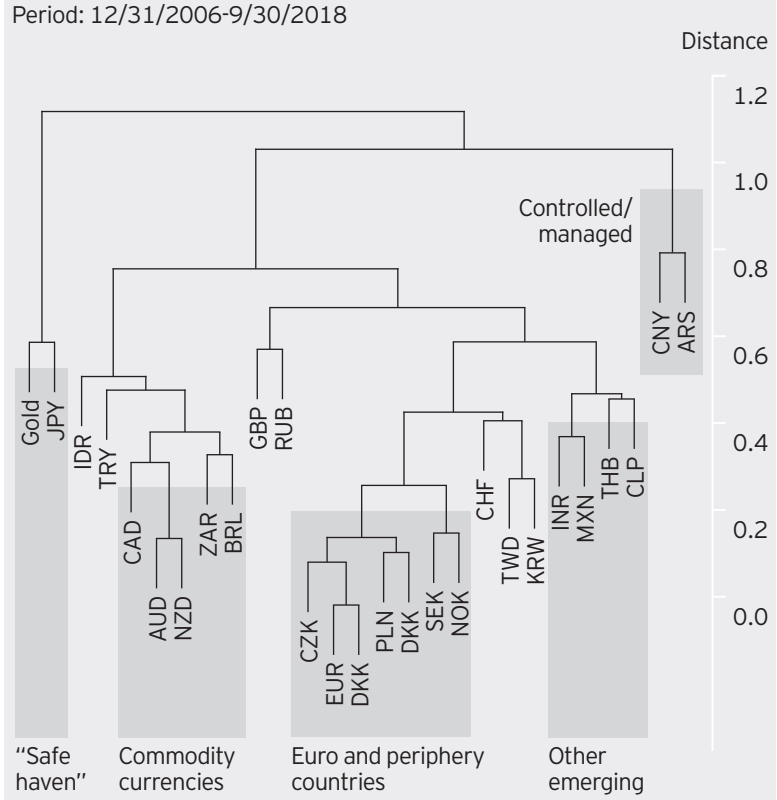
Figure 8 provides a visual illustration of currency groups that tend to move in tandem and with other factors such as region, commodities, or "flight to safety" during periods of heightened market volatility.

Since the emerging market crisis of 1997-98, EM currencies have tended to move in tandem across countries with distinctly different macro-economic fundamentals. As evident in Figure 9, this correlation spiked during the EM crisis of 1997-98, which emerged in East Asia and spread across EM countries through what was tagged as "financial contagion." During the decade of central bank quantitative easing, the correlation amongst EM currencies increased further as the Federal Reserve artificially suppressed interest rates and caused the market to trade in a "risk on/risk off" pattern. This is clearly evident in 2013 when the Federal Reserve announced the tapering of its USD bond purchases during the so-called "taper tantrum" and global investors sold "risk assets" including EM debt.

Whilst the correlation of EM currencies increased during quantitative easing, nevertheless the market appears to be better discerning differences amongst countries than was the case in 1997-98. The "financial contagion" evident in Figure 11 during the East Asia crisis of 1997, is less notable in subsequent country crises as, for example, Turkey in 2001 and Argentina in 2001. Figure 10 also illustrates the countercyclical "safe haven" status of JPY, CHF, gold and the Scandinavian currencies during crisis periods.

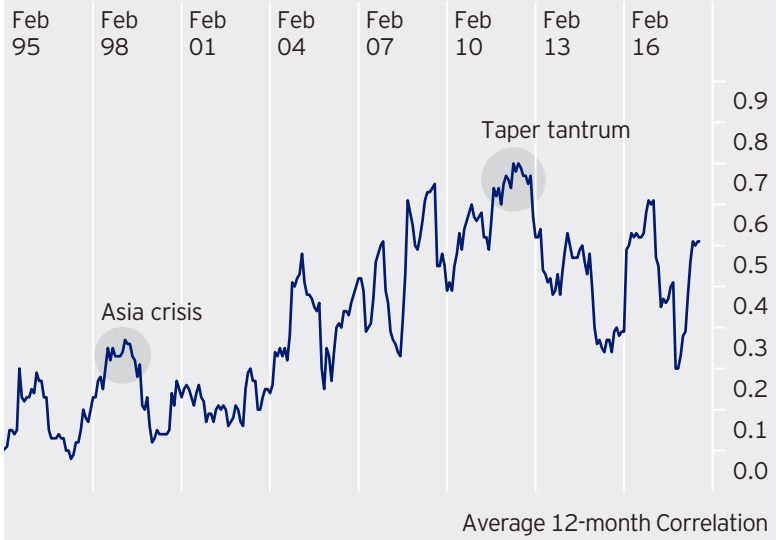
From an investment and diversification perspective, many central banks now hold EM currencies and EM bonds denominated in reserve currencies in reserve portfolios. Such an approach would be consistent with portfolio theory – to increase overall return with potentially improved risk characteristics based on volatility and correlation to the rest of the reserve portfolio. The overall share of EM currencies is highly constrained, however, by the required liquidity and credit risk factors discussed earlier.

Figure 8
**Currency Clusters and Underlying Risk Factors[5, 6]**
Based on the correlation across all currencies versus the USD;
Period: 12/31/2006-9/30/2018



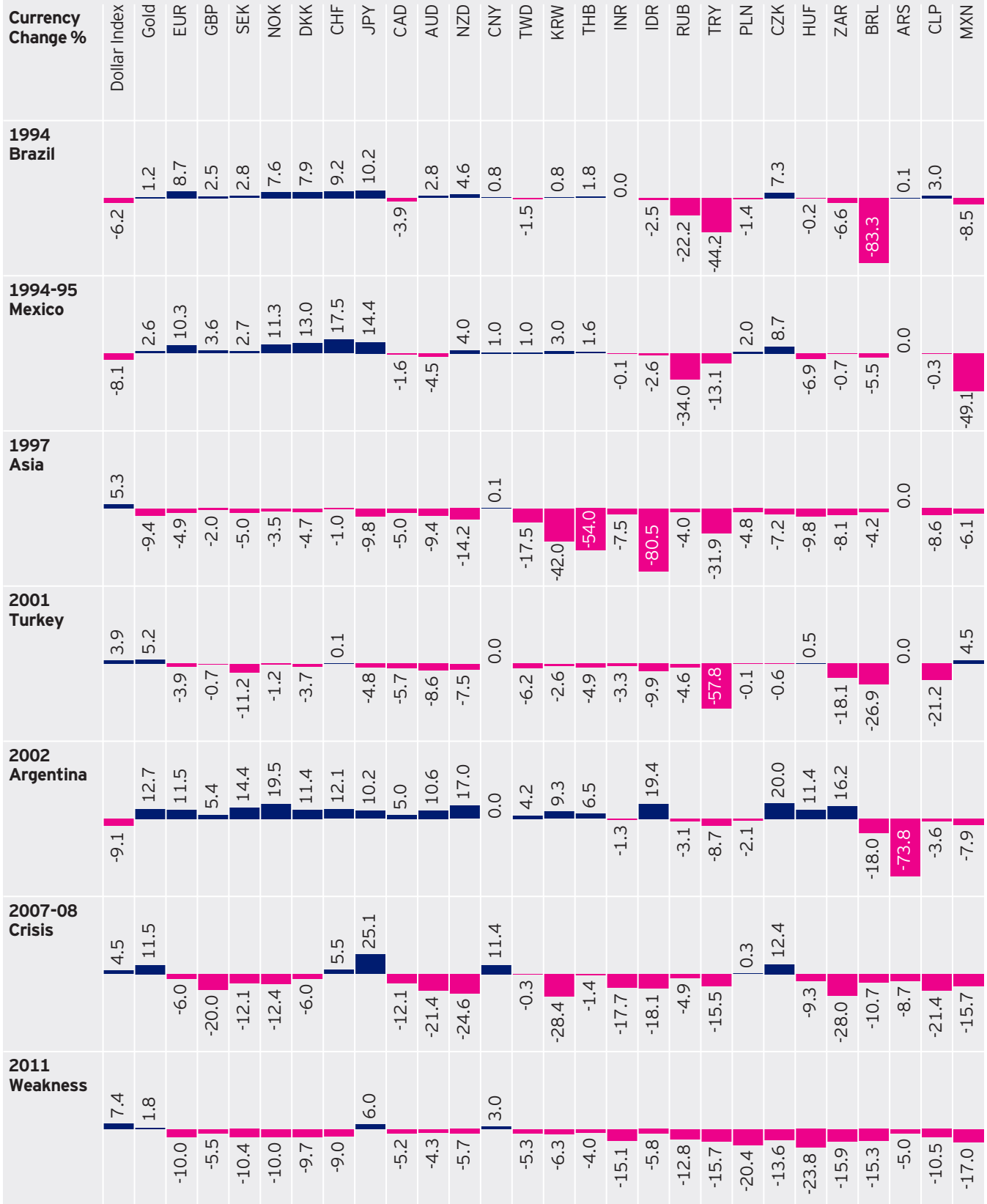

Sources: Bloomberg, Authors' calculation. Distance=1-correlation.

Figure 9
**Emerging market currencies tend to move together with the correlation increasing over crisis periods**




Source: Bloomberg, Authors' calculation based on the average 12-month rolling correlation across 14 major EM currencies. Note: The correlation of emerging market currencies ranged from no correlation in 1997 Q1 (value-0) to nearly perfect correlation during the taper tantrum 2012 Q2 (value 0.8) with 1.0 representing the maximum. Values of 0.5 represent a high level of correlation.

Figure 10
**Currency and gold movements during crisis periods[6]**




Source: Bloomberg, Authors' calculation. Data as at 30 September 2018. Note: Based on month-end FX rates. Except for the Dollar-index, all changes are calculated versus the USD.

## 5. The internationalization of the RMB and its prospects as a global reserve currency

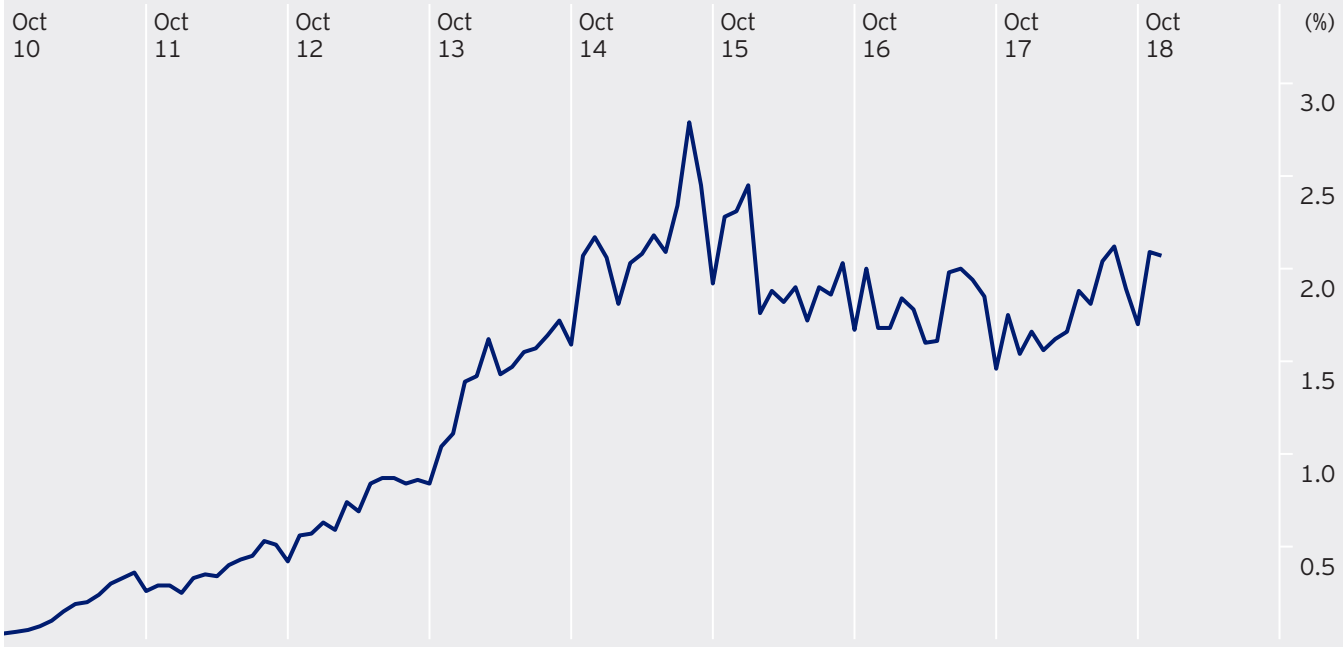
The IMF included the RMB in the SDR in November 2017 despite the existence of capital controls, noting the importance of China's share of international trade and the size of the economy. Since then, the number of central banks holding RMB as part of their reserves has increased but the share of aggregate reserves is still quite low at 1.84% despite the elimination of investment quotas under Qualified Foreign Institutional Investor (QFII) in 2016. A number of initiatives are underway, however, to promote the internationalization of the RMB for both trade settlements and reserves.

With respect to trade settlement, the government is promoting the use of the RMB as a settlement currency by strengthening the overseas infrastructure including allowing banks to hold offshore RMB accounts, setting up offshore sub-custodians and integrating the RMB into international and regional payments system protocols. These recent initiatives, however, have yet to bear fruit partly due to the positive externalities of pricing in a single currency and thus the "stickiness" of the USD as an invoice currency. In 2018, about 1.52% of total SWIFT payments were settled in RMB with lackluster growth over the past four years.

While the RMB on-shore bond market is the third largest after the combined Eurocurrency bond markets, with a market capitalization of $9.5 tn, its liquidity as measured by average daily turnover, is quite low relative to other reserve currencies. We would expect liquidity to improve in the near term, albeit at a gradual rate, with recent policy and technology initiatives to provide official and private sector access to the RMB on-shore bond market. Specifically, the PBoC and HKMA launched in 2017 a trading platform, Bond Connect, to provide official and private sector investors direct access to the on-shore bond market and eliminated its earlier program of investment quotas (QFII) for official sector investors. In response to these policy and technical developments, four major international index providers have announced plans to add on-shore RMB bonds to their global fixed income indices. In April 2019, the Bloomberg Barclays Aggregate (BBA), will add about $3.3 tn of RMB bonds to its global bond index, representing 6.03% of the $54tn global bond index. Investment vehicles that track the index will thus need to invest in this sector and rebalance their holdings in line with monthly changes in the index components with a positive impact on market liquidity. Currently, the relatively low level of liquidity can be attributed to the dominance of domestic banks, which holds 64% of total on-shore RMB bonds largely in buy and hold portfolios. We expect improvements in market liquidity to be gradual as foreign ownership of RMB on shore bonds currently represents only 2.1% of total bonds outstanding.

While the Chinese government has assured the right of repatriation to foreign investors in RMB bonds, capital restrictions on residents still exist and the dual exchange rate system may give reserve managers pause. Capital controls, which are often accompanied by multiple exchange rates, can complicate the use of a national currency as a reserve currency for several reasons. Capital controls imply that the external and internal prices of money--the exchange rate and the interest rate--would not represent market-clearing prices. To the extent that a capital-controlled currency is used as a reserve currency, there would in effect be two distinct moneys – one domestic and the other global; and as a corollary, there would be distinct onshore and offshore interest rate markets. This issue would pose a greater challenge in a world where other major exchange rates are floating, because the valuation of one major currency would reflect a segmented market, whereas the others would represented full market clearing prices. International market participants – both private and official – might share the concern that capital controls would permit greater exchange rate or interest rate stability than might be sustainable in the longer run with potential risks to the currency. This concern, however, may be offset by the desire to diversify away from a monopoly provider of currency reserves and towards a multi-polar reserve world.

Figure 11
**Share of RMB Payments in Global Settlements**




Source: Bloomberg, SWIFT. Data as at 31 December 2018.

# 6. Conclusions

The status of leading international currency implies a leading role in both official FX reserves and in private financial transactions, spanning both current account and capital flows. In the era of fiat reserve currencies backed by the credibility and resources of the central banks that issue reserve currencies and the States that issue reserve assets, this lead role has generally been played by the largest economy, and leading geopolitical player at the technological frontier, which tends to ensure military leadership as well as high productivity growth, per capita income and hence adequate resources to help facilitate global economic and geopolitical stability for international trade, finance and investment.

We would expect the USD to retain its advantage and disproportionate share of FX reserves for years to come, because of its intrinsic advantages – incumbency, liquidity, depth of capital markets and the policy credibility of the Fed and its repeatedly demonstrated willingness to take into account the spillovers of US policies on the rest of the world. That said, the challenges to the dollar over the longer term are significant, including the large size and role of other major economies in world output, trade and capital flows as well as international concern about erratic or unpredictable behaviour of US policies beyond the remit of the Fed, including the withdrawal from multi-lateralism, imposition of sanctions and loose fiscal and aggressive trade policy, which are largely in the political sphere.

We would therefore also expect the two main contenders for the USD–EUR and RMB--to play an increasing role with continuing purchases of gold as a store of value and diversifier. These offer competition for the dollar, which may constrain the ability of the US to pursue economic or other policies that deviate too far from the needs of the rest of the world. Arguably, this has already been happening in the current economic cycle. The US Federal Reserve delayed plans for tapering quantitative easing in 2013-14 when both US and global financial markets came under pressure; again relented in 2015-16 when global concern about a devaluation in China caused "spill backs" into major economies including the US; and may be doing so again now, as the global economy slows.

We would expect gains by the EUR and RMB at the expense of the USD to be gradual, constrained by the intrinsic challenges of each as a competitor to the dollar, pending quite different institutional reforms in each case. The euro seems very unlikely to develop a full fiscal, banking, capital markets or ultimately, political union which in turn will limit the market size, depth and liquidity of reserve assets relative to the dollar. Specific government bonds may be perceived and treated as reserve assets, such as German Bunds, but others as credit assets, such as Italian BTPs.

In the case of China, the required reforms are proceeding with much greater vigour and speed, including liberalizing and opening up domestic capital markets to cross-border flows both from private and official market participants. However, capital controls on residents are likely to be seen as a source of market segmentation impeding transparent and full price discovery. Such factors might slow the international adoption of the RMB as a store of value in private and central bank portfolios, perhaps more than as a medium of exchange for settlement and invoicing. On balance, it is conceivable that the RMB gains on the USD or takes market share from the EUR, because China's capacity to advance RMB internationalization exceeds the Eurozone's capacity to fully federalize or sufficiently to produce a large, unified government bond market. In addition, the rate of potential growth in both the United States and China exceeds that of the Eurozone, given demographics and trends in innovation and productivity growth, which in turn implies that the Eurozone will tend to lag the other two large economies in their shares of world trade and capital flows, respectively.

Other smaller currencies are likely to play important supporting but not significant roles in the international reserves. Sterling may continue to be an important diversifier, depending on how the Brexit process plays out; if the UK remains a dynamic, open and attractive investment destination as it has been for the last several decades, then the expected EU exit may have limited effect beyond the real depreciation of sterling that has already taken place.

The Japanese yen will likely remain an important reserve currency as a perceived safe haven, along with CHF, given both countries' roles as net international creditors – despite their relatively slow growth and size, respectively. Episodes of risk-off are likely to result in appreciation of both currencies, especially in recessionary or crisis like environments, and so macro factor or correlation based reserve exposure will likely continue to be sought out.

It is also worth noting that some regionally important emerging market economies are likely to continue to play a modest role as regional reserve currencies for smaller neighbouring economies, which have proportionally large trading or investment relationships and in some cases as base currencies for pegs. Examples include South Africa and India.

In closing, it's worth noting that geopolitical trends, shifts and shocks can make a major difference to the composition of reserves – but it is important to distinguish between one-off shocks and sustained trends. For example, one effect of US sanctions on Russia was the re-allocation of Central Bank of Russia reserves from USD to EUR, RMB and gold. Russia may well continue to invest ongoing current account surpluses in non-dollar assets, but the bulk of this is probably idiosyncratic in the sense of applying to a few countries. A more significant challenge to the role of the dollar could arise in opposition to the use of dollar sanctions or extraterritorial application of US laws, if several countries opted together to shift away from the dollar to one other currency for commodities and trade – with the EUR and RMB being the main candidates. Indeed the on-going initiatives by the EC and China to set up alternative arrangements for trade settlement reflect the desire for autonomy in geo-economic trading and geopolitical relationships. In the end, however, central bank policy decisions on currency composition will be driven by individual policy mandates and preferences; and decisions regarding invoice currency determined by the preference of international traders. The decision on the USD will ultimately be in the hand of market participants, based on their assessment of the credibility of US policies and institutions, with limited ability of governments to influence their choice.

## Notes

1 For a history and original research on the role of currencies in reserves over the last two centuries, see Barry Eichengreen, Arnaud Meht, Livia Chitu, How Global Currencies Work: Past, Present and Future, Princeton University Press, 2018.

2 Whitepapers can be found here: www.igsams.invesco.com

3 World Trade Organization, 2017.

4 IMF, International Financial Statistics.

5 This cluster analysis chart, a dendrogram, graphically represent by distance the correlations across all currencies' monthly changes versus the US dollar. Currencies grouped together at the bottom of the chart are more correlated with each other. We thus consider them "similar" and have attributed to these clusters an underlying risk factor based on observed movements over time. Currencies that are connected closer to the top of the chart are less correlated, thus less similar with each other.

6

| Currency symbol | Currency |
|---|---|
| JPY | Japanese Yen |
| IDR | Indonesian Rupiah |
| TRY | Turkish Lira |
| CAD | Canadian Dollar |
| AUD | Australian Dollar |
| NZD | New Zealand Dollar |
| ZAR | South African Rand |
| BRL | Brazilian Real |
| GBP | Pound Sterling |
| RUB | Russian Ruble |
| CZK | Czech Koruna |
| EUR | Euro |
| DKK | Danish Krone |
| PLN | Polish Zloty |
| HUF | Hungarian Forint |
| SEK | Swedish Krona |
| NOK | Norwegian Krone |
| CHF | Swiss Franc |
| TWD | New Taiwan Dollar |
| KRW | South Korean Won |
| INR | Indian Rupee |
| MXN | Mexican Peso |
| THB | Thai Baht |
| CLP | Chilean Peso |
| CNY | Chinese Yuan Renminbi |
| ARS | Argentine Peso |

## Investment risks

The value of investments and any income will fluctuate (this may partly be the result of exchange rate fluctuations) and investors may not get back the full amount invested.

## Important information

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Data is as at 31 December 2018, unless otherwise stated.

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