Time to evolve
A quarter-century of FX reserve management

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Overview and Executive Summary

For 25 consecutive years, UBS has hosted one of the most successful and longest running events in the asset management industry, the UBS Reserve Management Seminar. Over the years it has developed into one of the leading events for central bank reserve managers addressing all areas of asset allocation as well as new and emerging (geo-)political and economic trends. These days, it features around 60 institutions from over 40 different countries each year.

This has also allowed us to monitor central bank investment approaches for 25 years through the Annual Reserve Management Survey, an integral part of the event. At this year’s 25th Seminar held in Thun, Switzerland in June 2019, we asked participants to look back and share with us their views about the evolution of FX reserve management over the past 25 years and their expectations for the next 25 years. The key results are illustrated in the two graphs on page three.

This paper is the outcome of the above-mentioned survey as well as our rich history of providing institutional solutions and advisory services to some of the largest and most prestigious sovereigns globally. Overall, we will address the following key trends in the paper:

- Since the Asian financial crisis in 1997, foreign exchange (FX) reserves held by central banks increased several times over and reached a peak of USD 12 trillion in 2013. As a result, many countries now find themselves with a level of reserves well above the level considered adequate to support monetary and exchange rate policies.

- The dramatic rise in fx reserves coupled with the fall in fixed income yields prompted a diversification away from government bonds. Compared to 25 years ago, central banks invest into a much wider range of asset classes including corporate bonds, emerging market debt and equities. The diversification into equities has been the most remarkable evolution in the asset allocation of central banks; nowadays, a central bank’s investment profile is more similar to that of other institutional investors such as pension and insurance funds which diversify across a wide range of asset classes.

- Increased diversification across asset classes and regions however has not led to increased diversification across currencies: the USD remained the dominant reserve currency over the last 25 years. The introduction of the euro – which was mentioned as the third-most important development over the past 25 years in the survey - raised expectations of a decrease of the dominant role of the greenback. These expectations did not materialize, mainly as a result of the euro fiscal crisis. The inclusions of the RMB in the SDR basket made the Chinese currency a new challenger and indeed the RMB is making progress towards establishing itself as a global reserve currency supported by the opening up of its huge onshore fixed income market. However, despite being on track, the rise of the RMB to leading reserve currency status is likely to be gradual.

- The increased reserves managed by central banks, coupled with the increased holdings of government bonds acquired by advanced economies’ central banks via QE programs has dramatically expanded the role of these institutions as investors in global markets. Currently, central banks hold around USD18 trillion of government bonds issued by a relatively small number of advanced economies.

At a policy level, this raises the question of a potential conflict of interest between monetary policy and asset management objectives, and central banks are seeking ways to balance their competing mandates. Their relatively short-term investment horizon of less than three years reflects their focus on capital protection and liquidity. Asset price cycles are typically much longer, potentially preventing them from participating in the long-term value creation of the global economy.

In light of the evolution in FX reserve management over the last 25 years, what can we expect over the next 25? The dramatic rise in reserves experienced since the early 2000s is unlikely to endure in the future. The current account surplus of commodity and manufactured-goods exporting economies has already shrunk as international trade grows slower and commodity prices remain low. Global FX reserves are likely to stagnate in the future (with some notable exceptions).

Will the reserve diversification trend continue in the future? According to one third of respondents to the survey, this will be the case. This would eventually go along with a move into alternative asset classes such as real estate and infrastructure. A similar share of about one third replied that diversification into equities is also likely to continue. The main factor behind
the continuation of the diversification trend is the low yield environment which is expected to last for a prolonged period of time.

In terms of reserve currency composition, two-thirds of respondents said that the USD will remain the dominant reserve currency. And about 40% of respondents agreed that the over the next 25 years, the RMB will become a leading reserve currency on a par with the USD and the euro. In other words, central banks believe that the international payment system will gradually shift to a multi-polar currency system. It has yet to be seen if this will potentially even include digital currencies issued by central banks.

In terms of the evolution of the governance and investment frameworks, one approach more and more adopted by the most innovative sovereign investors could ultimately also be implemented by central banks: The Reference Portfolio approach is a simple, transparent and resilient concept that allows high-level discussions with stakeholders about risk and return drivers and to supervise and manage investment strategy, benchmarking, rebalancing as well as compensation. We believe this investment framework would reduce the risk-averse bias affecting the majority of central banks, empower investment committees vis-à-vis boards and allow for more reliance on asset management expertise.

A more sophisticated view of risk and return may help central banks deal with a number of emergent issues, including the role of sustainable investing in a time of climate change. Another key issue is the management of gold as an asset class amid the rise of a multi-polar currency system, especially if this ultimately includes digital currencies, such as the concept recently highlighted by Bank of England Governor Mark Carney. His envisioned Synthetic Hegemonic Currency would exist as a network of central bank digital currencies, which would help reduce the role of the USD in the global financial cycle.

Finally, recent cyberattacks against central banks are an example of the newly emerging issue of cybercrime. Central banks must take a leading role in managing this risk – in their daily operations, in their role as guardians of financial stability and in the management of their own portfolios.

Exhibit 1: RMS survey result - What were the three most impactful developments regarding FX reserve management over the last 25 years?

Exhibit 2: RMS survey - Looking at the next 25 years, with which statements would you agree?

Growth in FX reserves

The rapid accumulation of foreign exchange (FX) reserves has been a distinctive feature of the global economy over the last 25 years. Since the Asian financial crisis in 1997, FX reserves increased several times over and reached a peak of nearly USD 12 trillion in 2013. The accumulation of reserves primarily in emerging countries – but also in some developed countries such as Switzerland and Japan – was propelled essentially by three intertwined phenomena:

– The advent of China and other Asian countries as an increasingly important part of the global manufacturing value chain, translating into large and persistent current account surpluses;
– An upsurge in the demand for commodities in order to build infrastructure and housing for the new urban middle class, which in turn translated into soaring commodity prices, leading to a rapid accumulation of wealth in commodity-exporting economies;
– And last but not least, an unprecedented rise in capital inflows into emerging markets which received further impetus following the launch of quantitative easing in post-2008 developed economies.

Reserves are largely held by emerging markets

The growth in global FX reserves has largely been an emerging markets (EM) story. At the end of 2014, EM economies accounted for USD 7.7 trillion of FX reserves, nearly 70% of the total. China alone accounted for almost USD 4 trillion and the oil-exporting emerging economies for another USD 1.6 trillion.

FX reserves are concentrated in a relatively small number of countries. In 2018, four countries – China, Japan, Switzerland and Saudi Arabia – accounted for 50% of global reserves, according to the World Bank. The top 10 countries accounted for 70% of the total. With the exception of a few countries, FX reserves have remained broadly stable in the majority of advanced economies.

The growth in FX reserves managed by EMs started early in the last decade with the rise of emerging markets and the commodity price boom. It continued uninterrupted after the financial crisis of 2008 - albeit at a slower rate – as growth in EMs remained resilient, despite the recession in advanced economies. Oil prices were quick to recover from the temporary drop experienced during the most acute phase of the global crisis, thus filling the coffers of commodity-exporting economies.

**Exhibit 3: Growth in FX reserves EM and DM 1960-2018**

Global reserves peaked in 2013 at USD 11.9 trillion. They fell between 2014 and 2016 by about USD 1 trillion and then stabilized at around USD 11 trillion in the following years. The sudden drop in FX reserve growth experienced in 2014-16 reflects several factors, including the strength of the USD. However, two main factors stand out: a) at the end of the oil price ‘super-cycle’ which wiped out the current account surpluses of commodity-exporting countries; and b) the drop in Chinese FX reserves following the mini-devaluation of the RMB in 2015, which forced the People’s Bank of China (PBoC) to intervene in the FX market to support the Chinese currency. Since then, Chinese FX reserves have stabilized at above USD 3 trillion.
Reserves are often well above the level required for precautionary motives

The dramatic rise in FX reserves experienced over the last two decades meant that many countries found themselves with a level of reserves well above the level considered adequate to support monetary and exchange rate policies.

What the adequate level of reserves is, is of course a matter of debate and can vary across countries. However, we believe that FX reserves are now in many cases far larger than what could plausibly be needed for macroeconomic intervention, for instance to intervene in FX markets. An additional factor reducing the need of holding large reserves is the widespread use of floating exchange rates which require a lower level of reserves to defend their currencies markets (the exception being the Gulf economies which are still pegged to the USD).

On our view, the reduced need to hold reserves for exchange rate intervention coupled with the huge increase in reserves means that many central banks have by now become de facto sovereign wealth funds (SWFs).

Exhibit 4: FX reserves in selected countries

<table>
<thead>
<tr>
<th>Country</th>
<th>FX Reserves 2018 (USD bn)</th>
<th>FX Reserves in %GDP</th>
<th>GDP 2018 (USD bn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hong Kong</td>
<td>424,534,054,797</td>
<td>117.0%</td>
<td>363</td>
</tr>
<tr>
<td>Switzerland</td>
<td>744,166,801,994</td>
<td>105.9%</td>
<td>703</td>
</tr>
<tr>
<td>Taiwan</td>
<td>464,000,000,000</td>
<td>78.8%</td>
<td>589</td>
</tr>
<tr>
<td>Singapore</td>
<td>287,465,993,957</td>
<td>79.6%</td>
<td>361</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>496,126,104,024</td>
<td>63.4%</td>
<td>782</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>142,270,000,000</td>
<td>58.7%</td>
<td>242</td>
</tr>
<tr>
<td>Thailand</td>
<td>199,296,461,438</td>
<td>40.9%</td>
<td>487</td>
</tr>
<tr>
<td>Israel</td>
<td>115,265,900,521</td>
<td>31.2%</td>
<td>369</td>
</tr>
<tr>
<td>Malaysia</td>
<td>99,890,469,255</td>
<td>28.2%</td>
<td>354</td>
</tr>
<tr>
<td>Japan</td>
<td>1,218,935,321,253</td>
<td>24.9%</td>
<td>4971</td>
</tr>
<tr>
<td>Korea</td>
<td>908,780,329,742</td>
<td>24.6%</td>
<td>1619</td>
</tr>
<tr>
<td>Russia</td>
<td>381,575,041,083</td>
<td>23.4%</td>
<td>1630</td>
</tr>
<tr>
<td>UAE</td>
<td>99,194,475,479</td>
<td>23.4%</td>
<td>424</td>
</tr>
<tr>
<td>China</td>
<td>3,091,881,265,359</td>
<td>23.1%</td>
<td>1447</td>
</tr>
<tr>
<td>Brazil</td>
<td>371,933,901,818</td>
<td>19.9%</td>
<td>1868</td>
</tr>
<tr>
<td>Poland</td>
<td>111,656,116,423</td>
<td>19.1%</td>
<td>586</td>
</tr>
<tr>
<td>Mexico</td>
<td>171,434,852,467</td>
<td>14.0%</td>
<td>1223</td>
</tr>
<tr>
<td>India</td>
<td>374,423,187,184</td>
<td>13.8%</td>
<td>2716</td>
</tr>
<tr>
<td>Indonesia</td>
<td>117,425,045,943</td>
<td>11.5%</td>
<td>1022</td>
</tr>
<tr>
<td>UK</td>
<td>159,871,954,949</td>
<td>5.7%</td>
<td>2828</td>
</tr>
</tbody>
</table>

Source: World Bank, as of year-end 2018

Reserves likely to stagnate in the future

As mentioned earlier, FX reserves have recently stabilized and currently stand at around USD 10.5 trillion. The key underlying drivers of the dramatic growth in FX reserves since the early 2000s have been massive current account surpluses in Asian manufacturing goods-exporting and Middle Eastern commodity-exporting economies. These drivers have however weakened over the last few years as oil prices remain low and protectionism takes hold.

2018 was the first year that Emerging Asia had a negative current account surplus. The current surplus of the largest country in this region, China, has already fallen dramatically and according to the International Monetary Fund (IMF), will turn negative in 2022. This is largely the result of China’s shifting growth paradigm from export to domestic consumption. Furthermore, we believe that the RMB is likely to float more freely in the future, thus reducing the need for holding a very high level of reserves. USD 3 trillion of reserves have become a symbol of Chinese financial firepower and stability and are expected to remain at current levels for some time. However, further increases are unlikely, in particular as a result of the fact that further interventions in the FX market to weaken the RMB are unlikely.

The current account of Middle Eastern oil-exporting economies already turned negative in 2015 following the end of the oil price ‘super-cycle.’ In addition to that, fiscal break-even levels in oil-exporting economies are continuously increasing to guarantee social peace and support diversification of their economies away from oil. The IMF forecasts that the region will have current account deficits over the next years. Furthermore, climate change policies could ultimately reduce oil demand over the next decades, eventually reducing oil prices.

Exhibit 5: Current Account, Selected regions, 2000-2024E

Major advanced economies (G7) Emerging and developing Asia
Middle East and North Africa

Source: IMF WEO, April 2019

Falling current account surpluses point to lower growth in FX reserves. However, there are some notable exceptions. Among the largest FX reserve holders, the most obvious candidates are Japan and Switzerland. Given their safe haven status in times of geopolitical uncertainty, they might need further interventions to prevent their currencies from appreciating too much. This is likely to lead to continuing reserve accumulation. However, recently the US administration has considerably toughened its stance on FX interventions, even arguing that devaluations might be enough to justify retaliation, for example in the form of tariffs. Should such policies be maintained and even expanded in the future, it will become more difficult for these countries to continue intervening in FX market. Thus, there might be a limit to the growth in their reserves. On the other hand, US President Trump has repeatedly criticized the strength of the US dollar and the Commerce Department was reportedly asked to assess the possibility of weakening the USD with interventions.

Overall, the most likely scenario is that global FX reserves will stagnate in most countries in the future, with some notable exceptions.
Diversification and the search for yield

The rise in the size of reserves, together with the secular fall in yields, has fueled another powerful trend among reserve managers: diversification away from government bonds. Indeed, the diversification away from government bonds was mentioned by surveyed participants as the second most impactful development in FX reserve management over the last 25 years.

According to the UBS survey, capital preservation and liquidity are the primary investment objectives of central banks, and return maximization is only a secondary objective. This has not changed much over the years as the primary objective of reserves is to intervene if needed when macro or financial stability is at risk. As a result, central banks historically did not invest in, or had negligible allocations to corporate bonds, asset-backed securities, emerging market debt and equity or alternative asset classes. The bulk of their assets was held in cash, bank deposits and short-duration government bonds of a selected group of advanced economies.

The impact of the Global Financial Crisis (GFC)

When we asked about the most impactful event or development over the past 25 years in our last annual Reserve Management Seminar Survey, by far the highest number of respondents (76%) nominated the Global Financial Crisis of 2007/2008 (GFC) as their top pick. This event, which is generally considered to be the most severe financial crisis since the Great Depression, had a significant impact on central bank investment portfolios, as various products turned out to be much less safe and liquid than one would assume from highly rated fixed income instruments.

Since 1998, our annual Reserve Management Seminar Survey has asked central banks which asset classes are approved at their institution. Twenty years ago, central banks were allowed to invest in very few asset classes including deposits, sovereigns, supranationals and US agencies. Only 10% of the surveyed institutions were allowed to invest in corporate bonds, 4% in bank debt and 2% in corporates. No institution had emerging market debt or equity as eligible asset classes.

Over the years leading to the financial crisis, the percentage of central banks allowed to invest in these ‘less traditional’ asset classes steadily increased. By 2008, about half of the surveyed institutions could invest in these asset classes and a few institutions ventured into EMD and equities.

The survey’s results in the following years (2009-11) show how central banks reacted to the GFC. The number of institutions which were allowed to invest in mortgage-backed and asset-backed securities (MBS/ABS) declined from a peak of 52% in 2007 to a low of 27% in 2010. The eligibility of bank debt was also strongly reduced, dropping from 48% in 2008 to 20% in 2011. Finally, US agencies, which had always been a staple in central bank portfolios with an eligibility rate of 54% already in 1998, dropped from 86% in 2007 to 64% in 2011. The steady rise of equity as an eligible asset also slowed down in the in the year following the GFC, clearly reflecting the sharp losses experienced by investors in 2008.
Ultra-low interest rates and the search for yield

However, the slowdown in the diversification trend after the financial crisis was only a pause. The introduction of ultra-low and unconventional monetary policy practices had a dramatic impact on the profiles of reserve managers. As Exhibit 8 outlines, the period before the GFC was marked by solid returns for conservative portfolios, which in general surpassed inflation rates, thus allowing central banks to achieve their investment objectives. For example, our most conservative sample portfolio ‘CB1’ which is a blend of short-term cash investments and advanced economies’ government bonds with a maturity of up to 3 years, achieved solid returns of around 5% over 2002-08. In contrast, for the period from 2009-2018, the same portfolio generated average annual returns of 0.9%, and therefore negative real returns in almost all years.

This had a pronounced effect on central bank portfolios, in particular ultra-conservative ones which primarily invest in short-term highly-rated debt. With certain areas of fixed income either discredited or offering significantly lower and in many cases negative (real) yields, central banks became part of a large group of global investors searching for yield in many cases negative (real) yields, central banks became income either discredited or offering significantly lower and

Exhibit 8: Central bank sample portfolio returns since 2002

<table>
<thead>
<tr>
<th>Year</th>
<th>CB1</th>
<th>CB2</th>
<th>CB3</th>
<th>CB4</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>3.80%</td>
<td>5.00%</td>
<td>2.90%</td>
<td>2.70%</td>
</tr>
<tr>
<td>2013</td>
<td>3.80%</td>
<td>5.00%</td>
<td>2.90%</td>
<td>2.70%</td>
</tr>
<tr>
<td>2014</td>
<td>3.80%</td>
<td>5.00%</td>
<td>2.90%</td>
<td>2.70%</td>
</tr>
<tr>
<td>2015</td>
<td>3.80%</td>
<td>5.00%</td>
<td>2.90%</td>
<td>2.70%</td>
</tr>
<tr>
<td>2016</td>
<td>3.80%</td>
<td>5.00%</td>
<td>2.90%</td>
<td>2.70%</td>
</tr>
<tr>
<td>2017</td>
<td>3.80%</td>
<td>5.00%</td>
<td>2.90%</td>
<td>2.70%</td>
</tr>
<tr>
<td>2018</td>
<td>3.80%</td>
<td>5.00%</td>
<td>2.90%</td>
<td>2.70%</td>
</tr>
<tr>
<td>2019</td>
<td>3.80%</td>
<td>5.00%</td>
<td>2.90%</td>
<td>2.70%</td>
</tr>
</tbody>
</table>

Source: UBS Asset Management as of 30 August 2019. Note: These are example portfolios and do not represent actual central bank investment portfolios. Rather, they show investment returns over indicated timeframes for example portfolios invested as indicated. Note: CB1 (Liquid), CB2 (Corporate), CB3 (+ EM Debt), CB4 (+10% EQ).

Equity as a diversifier of fixed income portfolios

With certain spread products discredited from the GFC and ultra-low or even negative yields for high-quality government bonds spreading around the globe, the idea of equities as a tool of diversification gained traction in the years after the financial crisis. As can be seen in Exhibit 7, while MBS/ABS, bank debt as well as corporates lost further ground in the years after the GFC and only started to see a turnaround in eligibility rates in 2011/12, those for Equities started rising from 2009 onwards, reaching a new high of 24% already in 2012, before a setback occurred due to ongoing economic uncertainty in the early 2010s.

When looking at Exhibit 9, which splits typical central bank portfolios with different degrees of diversification into three distinctive periods (before, during and after the GFC), one can see that increased diversification into equities was a rather successful strategy after the GFC, a period that turned out to be one of the longest bull markets in history. While overall lower than in the ‘good’ times before the crisis, portfolios that not only included a certain degree of corporates and Emerging Market (investment grade and in hard currency) debt but also 15% of equities, achieved considerable outperformance when compared with very conservative portfolios, which did not even beat inflation.

One often overlooked tailwind for equities was the deteriorating liquidity situation in fixed income markets. Several years after the GFC, ‘decreasing liquidity in certain fixed income markets’ started to appear as a concern that was mentioned more and more frequently in our annual RMS surveys. While various factors contributed to this problem, it is a fact that the fixed income area is much more fragmented and less easy to capture with benchmarks. For example, while many or most large US companies have only one very liquid global share class, the same companies can have over a thousand outstanding debt instruments. For an investor with a traditionally high liquidity preference like central banks, equities are therefore attractive, in particular because the tendency of equities to sharply correct from time to time can be smoothed out with the remaining fixed income-heavy portfolio.
Will the reserve diversification trend continue?

Given the stagnation in the level of FX reserves, the return that central banks are able to generate on accumulated assets will become even more important. Many central banks transfer profits to their sponsoring governments, and pressure on these institutions to help on the fiscal side is rising. For instance, the central bank of India has recently made a massive transfer to the Indian government to assist in keeping the fiscal deficit in check. Furthermore, many central banks use the return they generate on accumulated assets to cover their operational costs.

More than one third of respondents to the most recent UBS survey considered the fact that central banks will continue diversifying as one of the top trends of the next 25 years. This would eventually go along with a move into alternative asset classes such as real estate and infrastructure. And a similar share replied that the diversification into equities will continue.

There are several factors pointing in this direction. Most importantly, the era of low interest rates does not appear to end any time soon. The lower-for-longer environment might turn into ‘lower forever,’ with long term interest rates remaining at historical lows. While one cannot exclude a return to ‘normal’ interest rates, the Japanization of the global economy with more countries battling low growth and deflation appears to be more than simply a low-probability scenario. On top, the current cycle which has created one of the longest bull markets in history might come to an end sooner rather than later, and long before any normalization in monetary policy could have taken place. The severity of the next downturn might play an important role in determining in particular the outlook for fixed income as an asset class for years to come.

With the risk of interest rates staying low or negative for a very long time in a global environment that might have less and less constraints when it comes to unorthodox monetary policies, fixed-income heavy investors like central banks would feel unprecedented pressure to diversify. Central banks face two choices: a) further increase allocation to equity; b) further broaden the investible universe and include alternative asset classes.

Central banks that diversified into equities generally allocate to this asset class a maximum of 20%. Increasing equity exposure beyond this level might prove controversial given the increase in volatility and increased downside risk. Following what other institutional investors have already done, central banks – particularly those with FX reserves well above the level required for precautionary motives – might consider to diversify into alternative asset classes. Alternative asset classes such as real estate and infrastructure bonds could provide return enhancement (illiquidity premium) and – most importantly – diversification away from government bonds and other fixed income assets.

These asset classes are illiquid but generally have lower volatility than listed equities, thus expecting to contribute to improved risk-adjusted returns. Furthermore, real estate does not carry any substantial reputational risk for central banks as one can invest into this asset class through a very diversified portfolio across countries and sectors. With regards to infrastructure bonds, a relatively new asset class, risk is probably higher than real estate given the lack of diversification opportunities. However, this asset class is developing very fast and more and more institutional investors are moving into this asset class searching for further diversification away from fixed income.
The dominance of the US dollar in global reserves – an average share above 60% over the last 25 years – has been a constant feature of FX reserve management. This is particularly surprising because speculations about the imminent demise of the dollar have become a stable refrain over the past decades.

Challenging the enduring dominance of the USD

When looking in more detail at the past 25 years, even though the euro devalued versus the USD in the first years of its existence, an impressive rally from 2001 to 2008 drove the share of euro reserves up significantly, from 18.3% in 2000 to 26% in 2010. Despite the ECB never openly supported the internationalization of the euro, the successful launch of the European currency fueled speculation that the euro could challenge the dominant role of the USD. Some people extrapolated this move at that time and expected the USD share of global reserves to drop below 50% soon and the euro to be at a par with the USD in the international monetary and financial system.

In 2011, the fiscal and financial problems in various European states and the specter of a breakup of the currency union quickly ended such assumptions. Since then the euro share of global reserves started to drop, falling below 20% in 2016 and remaining stagnant in the following years.

Smaller currencies in aggregate were also not able to offer an attractive investment alternative. With Japan pioneering ultra-low interest rates, the share of yen-denominated assets dropped from 6.1% in 2000 to 3.6% in 2011, before recovering to 5.2% in the last currency composition of official foreign exchange reserves (COFER) survey conducted by the IMF at year-end 2018. Commodity currencies experienced a small increase in allocations over the years, and both the Canadian as well as the Australian dollar are now close to 2% from 1.5% in 2012.

The enduring dominance of the USD reflects several factors including hard factors such as the size and depth of its financial markets, and soft ones such as the US dominance in global affairs. From an investment perspective, the USD is the ultimate safe-haven currency and during periods of heightened global risk, investors fly to the US Treasury market. This has not changed over the last 25 years and it is still true today as shown by the rise of the USD when uncertainty in global markets rears. It is not therefore surprising that the USD still represents the bulk of global reserves.

The RMB: A long-term challenger

The big newcomer and recent high-flyer in the group has been the Chinese RMB. In the 2019 UBS survey, 18% of participants picked its introduction into the SDR basket as one of the key events for reserve managers over the last 25 years.

RMB internationalization has been a primary goal for Chinese authorities since the 2000s, motivated by a number of goals: Lower borrowing costs and increased liquidity in domestic markets, lesser need for massive foreign currency reserves and finally, a reduction in the reliance on the US dollar. Therefore, when the IMF announced in 2015 that it would include the RMB as a reserve currency in its Special Drawing Rights (SDR) basket the following year, it raised expectations that the RMB could establish itself as a reserve currency relatively quickly. Also in the UBS Reserve Management Survey of the same year (2015), already more than 70% of respondents indicated that they were invested or had considered investing in the RMB.

Then, however, a slowdown happened in the march of the RMB to establish itself as a reserve currency. The 2015 ‘mini’ devaluation and the subsequent use of Chinese reserves to support the RMB as well as capital outflow restrictions on Chinese corporates and individuals are seen as the main culprit, as investors feared a reversal in the secular revaluation trend of the RMB and a slowdown in the internationalization of the Chinese currency.

Since then, numbers have improved substantially again and in the latest COFER data (Q1 2019), the RMB has reached a share of almost 2%. As nations do not hold their own currency in foreign reserves, the share of RMB in global reserves is actually higher, about 2.7%.

For more information, refer to the conference paper “RMB – A reality check” under www.ubs.com/am-gsm
In our latest RMS survey conducted in spring of 2019, we asked participating central banks for their long-term (and therefore not necessarily yet implemented) target allocation to the RMB. With 4.2%, the value is again up considerably from the previous year (3.2%) and makes us believe that the RMB will continue rising in the future. The RMB is closing the gap with the Japanese yen and the UK sterling and is set to become the third largest reserve currency in the next few years.

Two factors will determine the pace of the RMB’s march to reserve currency status: a) China’s macroeconomic stability; and b) the development and opening of its financial markets. Macroeconomic concerns about China remain, particularly in the light of the confrontation with the US over trade and technology, but have not slowed down the growing interest of central banks so far. Furthermore, the US-China confrontation over trade is likely to lower the rise of the RMB in global reserves given the uncertainty surrounding the Chinese economy. Many central banks hedge currency exposure with their long-term (and therefore not necessarily yet implemented) target allocation to the RMB.

The area where China is making tremendous progress is the opening up of its financial markets, particularly its fixed income markets. Macroeconomic concerns about China remain, particularly in the light of the confrontation with the US over trade and technology, but have not slowed down the growing interest of central banks so far. Furthermore, the US-China confrontation over trade is likely to lower the rise of the RMB in global reserves given the uncertainty surrounding the Chinese economy. Many central banks hedge currency exposure with their long-term (and therefore not necessarily yet implemented) target allocation to the RMB.

The attractiveness of RMB fixed income assets is also enhanced by higher yields when compared to euro- and yen-denominated sovereign bonds and, most importantly, by the low correlation of Chinese bond returns with those of the majority of advanced economies. Overall, the rise of the RMB to reserve currency status appears to be on track; but the rise is likely to be gradual with the USD remaining the dominant reserve currency for the time being.

Towards a multipolar financial system?

In the most recent UBS survey, two-thirds of respondents said that the USD will remain the dominant reserve currency. And about 40% of respondents agree that over the next 25 years, the RMB will become a leading reserve currency on par with the USD and the euro. In other words, the majority of central banks believe that the international payment and financial system will gradually shift to a multi-polar currency system with three leading currencies competing.

The shift to a multi-polar currency system is generally seen as a positive development for the international payment and financial system. The US economy represents 15% of the global economy and its exports only 10%. However, its spill-over effects on the rest of the world are greatly amplified by the dominant role of the USD in international payments, debt issuance and FX reserves. The dominance of the US dollar, reflected in its role as a global anchor for prices and interest rates, can force central banks to hold excessive USD-denominated foreign exchange reserves to match the significant USD exposure from trade and borrowing of the respective economy. The dominant role of the USD in credit and investment markets impacts investment flows to Emerging Economies by increasing volatility. Investment flows to emerging markets can reverse much faster than they have built up over time, making them act very destructive cyclical amplifiers in crisis situations.

The shortcomings of the current USD-based monetary and financial system were recently highlighted in a speech given at the 2019 Jackson Hole Symposium by Mark Carney, Governor of the Bank of England. Governor Carney also used the opportunity to discuss the idea of a Synthetic Hegemonic Currency (SHC) as a possible solution. Its main purpose would be to leverage recent technology progress – digitization and blockchain – to accelerate the shift away from a USD-dominated international financial system. Such technology solutions could actually ‘disrupt’ the network externalities which make the incumbent currency dominant. Some countries are already working on the issuance of digital currencies and it might just be a question of time for their formal introduction into our payment system.

However, what history taught us is that a shift to a new global currency system can be long and bumpy. This was indeed the case during the intra-war period when sterling and the USD co-existed for a long time, and the coordination problems were relatively small as only two currencies were involved, both originating from countries with the same language and relatively similar culture and values. In the future, three currencies will likely dominate the global financial system and coordination problems are likely to be higher. With such considerations also at the core of asset allocation strategies at many central banks, investment processes and FX diversification options might be disrupted much more over the next 25 years than most people would expect today.
The Global Financial Crisis was impactful for central banks not only for having prompted a diversification trend in reserve management in their search for yield. It was also a deciding moment for the increasing role played by central banks in supporting economies fighting stagnation and deflation. With the launch of extraordinary monetary policy measures such as quantitative easing (QE), the role of central banks in macroeconomic management rose sharply over the last years. As a result, the role of central banks as ‘investors’ in global markets has grown, requiring central banks to fulfill multiple tasks on the investment side of their balance sheets.

Central banks hold nearly half of advanced economies’ government bonds

Despite increased diversification, the bulk of FX reserves is still held in government bonds issued in a selected number of advanced economies including the US, European states, Japan and a few others. No accurate estimate is available, but it is reasonable to assume that about 70% of global reserves (ex-gold) are invested into the government bonds issued by these economies. By 2018-end, this amount would be around USD 8.0 trillion.

QE programs differ across countries in terms of eligible asset classes, size and timing. The balance sheets of central banks in the US, UK, Eurozone, Japan, Switzerland and Sweden expanded by about USD 11 trillion, largely as a result of asset purchases. Via QE, central banks can buy various fixed income assets including government bonds, corporate bonds, asset-backed securities and, in a few cases, equities (i.e. Japan). However, the bulk of QE programs concern government bonds with the goal of cutting long-term interest rates across economies. We estimate that of the USD 11 trillion of QE programs, USD 9 trillion originate from central banks’ acquisitions of government bonds from the countries concerned.

This means that either via FX reserves or through QE programs, central banks hold around USD 18 trillion of government bonds issued by a relatively small number of advanced economies. The total stock of government debt issued by these countries is around USD 40 trillion (2018-end). Thus, central banks currently hold nearly half of global ‘safe assets’, i.e. government bonds issued by leading advanced economies such as US, Japan, European states and a few others.

Risks for central banks coming from investment processes

The massive holdings of government bonds by central banks through FX reserve and QE raises two important questions. At a policy level, it raises the question of a potential conflict of interest between monetary policy and asset management objectives. Should central banks become concerned about potential losses on their holdings given their focus on capital protection, they might be tempted to adopt a pro-cyclical behavior. For instance, during the euro fiscal crisis in 2012, many central banks dropped the government bonds of the European periphery from their benchmarks. This was clearly in contrast with the policy carried out by the ECB to loosen monetary policy and increase the liquidity across the region. Ultimately, this is an issue of international coordination among central banks as often reserves held by emerging markets are invested into bonds acquired by advanced economies central banks via QE programs.

The second question relates to investment risk. As a result of the drop in global interest rates to zero or even negative levels, government bonds are a very expensive asset in both absolute and relative terms. Central banks are exposed to potentially large losses should interest rates rise. Whilst it is true that central banks often hold bonds until maturity accounted for on an accrual basis, most of these institutions adopt a mark-to-market approach in the measurement of their investment portfolio, and any drop in prices on such holdings is inevitably reflected in their reported profits and losses. For central banks doing QE, the risk is further increased by significant holdings of these additional fixed income assets.

Finally, central banks are exposed in a variety of ways to market stress events, not only as investors but also in their perceived role as ‘fire brigade’ and lender of last resort. The current cycle, which has created one of the longest bull markets in history, might come to an end rather sooner than later, and long before any normalization in monetary policy could take place. The severity of the coming downturns might play an important role in determining in particular the outlook...
for fixed income as an asset class for years to come. So what are the risks that we might experience another crisis with a severity on par with the GFC over the coming 25 years?

History has shown that financial innovations that have become popular (or even crowded) during an upswing have the potential to create severe stress events when tested in a sudden downturn as seen on Black Monday in 1987 or during the GFC in 2008. Are certain implementations of open-ended credit funds as well as risk parity, volatility-targeting and high-frequency trading strategies potential candidates that might amplify market movements in the next bear market? With systematically-relevant banks having relinquished balance-sheet intensive activities to a more fragmented group of players, it has yet to be seen if this new and yet untended financial ecosystem can provide sufficient levels of liquidity and stability under stress. How will market participants behave in an environment where they cannot rely on lenders of last resort for bail-outs, and where non-systemically relevant non-bank entities are expected to fail instead of getting rescued? And how will central banks react when the real economy experiences severe pain from dysfunctional credit markets? We might not have seen the final manifestation of unconventional monetary policies, and the balance sheet of central banks might be used in further, creative ways over the coming 25 years.

Are central banks too risk averse?

Despite the dramatic rise in the pool of assets managed by central banks and increased diversification across asset classes and regions, few changes have occurred in how central banks manage their reserves over the past two decades. This is surprising also in the light of the changes occurring in the investment landscape, including:

– the consensus view that future returns are likely to be lower than historical averages
– a changing geopolitical environment potentially marked by a stagnation in globalization and, more recently, increased protectionism
– the potential impact of disruptive trends such as digitization, artificial intelligence (AI) and climate risk on asset prices

There are three main areas where the investment framework of central banks falls behind that of other sovereign investors such as SWFs and pension funds.1 First of all, central banks have a relatively short-term investment horizon, reflecting their focus on capital protection and liquidity. According to the RMS survey, two thirds of central banks have an investment horizon of no more than three years; this is shorter than asset price cycles usually last, thus creating a procyclical investment behavior and preventing them from participating in the long-term value creation of the global economy.

Secondly, the governance of central banks’ investment activities is still very much centered on the board which retains full control over many portfolio decisions. Given the primary focus of boards on monetary policy objectives, decisions on asset allocation and investments are taken with respect to these objectives rather than taking into account market opportunities. The central bank acts as an ‘agent’ on behalf of the ‘principal,’ the government treasury; however, the agent’s risk-return trade-off may appear different from that of the principal. The board is generally more risk averse as any potential losses on its portfolios is perceived as damaging to its reputation.

Last but not least, central banks’ boards often have little experience in financial markets and portfolio management. This is surprising also in the light of the evolution of monetary policy frameworks. For instance, it is common nowadays that Monetary Policy Committees include ‘outsiders’ in order to leverage the expertise existing in academia and the private sector. In terms of reserve management, central banks only very rarely recruit asset management experts from the private sector and their use of ‘external’ asset managers is often dictated by low familiarity with a certain asset class (i.e. emerging market debt) or reputational concerns (i.e., listed equity).

Under this framework, the key governance process that should happen on a board/statutory level is the top-down development of an institution’s risk/return objectives and their subsequent expression as a simple 2-asset class Reference Portfolio, which is then broken down into a more granular Policy Portfolio by asset allocation specialists. A Reference Portfolio therefore sets the basis for long-term investment management and clearly attributes the roles and responsibilities between asset owners and managers. It stipulates the return and risk targets of the asset owner in a simple and straightforward manner, using liquid public market assets such as equity and fixed income.

The adaption of the Reference Portfolio approach embodies two important policies – the materialization of a long-term investment horizon and a clearer picture of return attribution. The performance evaluation governance process should be modified to reflect such a transition.

Could the reference portfolio approach be adopted by central banks? For sure such an investment framework would reduce the risk-averse bias affecting the majority of these institutions, empower investment committees vis-a-vis boards and allow for more reliance on asset management expertise.

Such an organization change would also require a clarification in how reserves should be invested. This could be done by clarifying central banks’ investment objectives in the legislation regulating the activities of the institution, similar to what happens in monetary policies where the legal remit of the central bank is clear and defined. This would also increase transparency on central banks investment activities, an area where there is still a lot of opacity.

Governance and investment frameworks of central banks need to evolve

With regards to asset allocation frameworks, the key industry trend is an ongoing shift away from static asset allocations (using multi-asset class benchmarks with fixed weights and ranges) towards much more flexible and dynamic approaches to risk allocation. A very popular approach adopted by the most innovative sovereign investors has been the Reference Portfolio concept. Pioneers of this trend have been the Canada Pension Plan Investment Board (CPPIB) (2006), the New Zealand Superannuation Fund (2010), the government of Singapore’s sovereign wealth fund (GIC) (2013) and China Investment Corporation (CIC) (2015). The Reference Portfolio is a simple, transparent and resilient concept that allows high-level discussions with stakeholders about risk and return drivers and to supervise and manage investment strategy, benchmarking, rebalancing as well as compensation. It allows performance attribution between what is coming from the strategic asset allocation (SAA), and the (out) performance achieved by the different investment departments and tactical teams.

### Exhibit 13: Reference Portfolio example for a typical Sovereign Wealth Fund

<table>
<thead>
<tr>
<th>Risk/Return Mandate</th>
<th>Reference Portfolio (RP)</th>
<th>Policy Portfolio (PP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return: 6% inflation + 4%</td>
<td>60% Equities 40% Fixed Income</td>
<td>Equities 35% Fixed Income 25% Long Govt Bonds 5% Inflation-Linked Bonds 3% Hedge Funds 10% Real Estate 7% Infrastructure 5% Private Equity 10%</td>
</tr>
<tr>
<td>Risk: 11% (SWF peer average)</td>
<td>40% Fixed Income</td>
<td>25% Real Estate 6% Corporate Bonds 3% Oil &amp; Gas 3% Inflation-Linked Bonds 3% Hedge Funds 10% Private Equity 6%</td>
</tr>
</tbody>
</table>

This risk/return relationship is then expressed by a simple ratio between publicly traded risky assets (equities) and risk-free assets (fixed income).

1 For more information, refer to the article “Central banks are too risk averse as investors” at https://www.suerf.org/policynotes/6063/central-banks-are-too-risk-averse-as-investors
Sustainability and climate change

ESG and long-term investing

While Sustainable investing has grown rapidly since the 2000s, the underlying investment concepts have undergone several transformations for more than the past 25 years. Already in the early 1980s, socially responsible investment funds offered negative screening approaches. These however often only reflected the negative screening criteria and ethical requirements of particular clients like faith-based groups and did not yet provide a basis for moving sustainable investment practices into the mainstream. Also, simply avoiding companies engaged in certain questionable practices fails to impact these companies themselves, and in the worst case might simply transfer ownership to those investors who are unconcerned about them, leading to no change at all. Most investors were however simply concerned about the financial impact of limiting ones investment options.

In response not just to these issues, but also the rapid growth in corporate sustainability disclosure, a focus on positive screening using Environmental, Social, and Governance (ESG) information emerged in the 2000s. Positive screening allowed investors to establish a systematic approach to identifying those companies which demonstrated high quality management and the ability to mitigate various sustainability risks. However, ESG screenings remained independent of financial analysis and research and only recently were efforts made to adequately include sustainability data in the financial models and recommendations used by mainstream asset managers.

Also, the concepts of long-term investing and sustainability started to merge together, and sustainable themes like energy efficiency, water, growing inequality and an aging population are an important part of long-term benchmark-agnostic strategies. At the same time, central banks noted that key principles of sustainability and long-term investing are in natural alignment with the objectives of sovereign investors, offering them not just the possibility to lead by example but also a potential source of alpha and a non-traditional framework to assess the risk/return of their investments in the context of their mandate and responsibility for their stakeholders. Therefore, most central banks started developing extensive sustainability frameworks in the late 2000s and implemented them into their portfolio management activities.

Climate risk rises to the top of central banks’ agendas

Then, in the late 2010s, climate risk came to the top of the sustainability agenda and posed additional challenges. Here, central banks not only face the challenge of integrating potential physical and transition risk into the models that guide their interest rate decisions and macro-prudential regulation. Due to the vast amount of QE assets and foreign exchange reserves that they are managing by now, they might be seen as ideal vehicles to enforce a climate risk agenda by exercising pressure via investment decisions. As politicians are literally starting to ‘feel the heat’ from the next generation of voters protesting in the streets and green parties winning big in European elections, the chances increase that the investment policies of state institutions could be seen as levers to make an impact. Central banks are already realizing that this could be a threat to their independence, but there are various challenges related to data availability and quality, as well as the operational integration of these vast amounts of data into their low-touch investment processes that are centered around passive investments in order to avoid conflicts of interest.

It has yet to be seen how central banks will address these challenges. Due to the nature of foreign exchange reserves, which by definition are denominated in ‘foreign’ currency and therefore cannot be invested in domestic companies, international coordination will be crucial in order not to interfere with the domestic climate transition frameworks of other countries. With government bonds still accounting for the vast majority of central bank assets, a transition towards certain groups of green bonds over time should be considered. However, the biggest contribution central banks can provide in the greening of the financial system will most likely be in the area of international standard setting and in creating an international level playing field for other investors and issuers. Therefore, we believe that international cooperation will be key and will largely define the effectiveness of the global response of central banks to climate change. By far the most important policy initiative that has developed over the past years is the Central Banks and Supervisors Network for Greening the Financial System (NGFS). Currently comprising more than 30 central banks and regulators, it carries the aim of contributing to financial stability by stepping up the efforts...
needed to achieve the targets of the Paris Climate Agreement. While the US is not part of the network at this point in time, the reach of those central banks and regulators who are involved already covers almost half of global GDP and two thirds of systemically important banks and insurers.

While the focus lies on the supervisory and macro-prudential tasks related to financial and systemic risk arising from climate change, along with better disclosure standards, the NGFS also encourages their participants to lead by example via the integration of climate-related criteria in their own operations, including the management of their own funds, pension funds and official reserves.

Key recommendations from NGFS

- Integrate climate-related risks into financial stability monitoring and micro supervision
- Integrate sustainability factors into own-portfolio management
- Bridge data gaps
- Build awareness and intellectual capacity and encourage technical assistance and knowledge sharing
- Achieve robust and internationally consistent climate and environment related disclosure
- Support the development of a taxonomy of economic activities
Over the past 25 years, gold took an interesting path from being considered an anachronism and relic of past monetary regimes in the early 2000s all the way to becoming an asset class that reserve managers bought in record quantities in 2018, according to the World Gold Council.

Central banks’ demand for gold has risen

According to the World Gold Council, of the average global annual demand of about 4350 tonnes, about 10% comes from central banks. With purchases of over 600 tonnes in 2018, central banks clearly bought more than their long-term average in the past year. All in all, the following reasons are most often quoted as the main drivers for gold investments by central banks:

- Higher levels of international reserves
- Diversification from US assets
- Investment guidelines and political, economic and geo-political conditions
- De-dollarization for political reasons

Therefore, several key drivers are behind the success story of gold over the past 15 years. Most importantly, the period since the low in gold prices in 2002 has coincided with a global surge in foreign exchange reserves. Even though the euro was introduced, pressure to find credible US dollar diversifiers was a persistent problem over the years, and gold has proven to be one of the few effective US dollar hedges.

Exhibit 14: Gold held by central banks (tonnes, left axis) and gold price (USD/Oz, end of period, right axis), 1994-2018

Source: Bloomberg, IMF, 2019

Is gold a good asset class for central banks?

We asked reserve managers at our 2019 RMS conference what factors are driving their institution’s decision to invest in gold beyond the most-commonly mentioned reasons of capital preservation, liquidity, diversification and lack of default risk. Here, 67% mentioned the generally good performance of gold during times of crisis, and a further 46% specifically mentioned that gold is part of their policy to hedge US dollar exposure.

But also the geopolitical angle has to be considered. The main buyers of gold in 2018 were the central banks of Russia (274 tonnes), Turkey (51 tonnes), Kazakhstan (51 tonnes), India (42 tonnes) and Hungary (28 tonnes). China, which only bought 10 tonnes in 2018, is expected to ramp up its gold purchases over the next years. For several countries, diversification away from US dollar assets has a strategic component. Not only does gold not have a default risk, it is not a title that has to be enforced via Western-based courts nor is it dependent on the US-led financial system.

All in all, the opinion on gold is still divided in the investor community, and the same goes for reserve managers. While some consider it as an essential diversifier and include it in their asset allocation strategy for central bank portfolio management, others follow the criticism often voiced by famous investors like Warren Buffett, who consider gold as an unproductive asset where performance is solely based on the expectation that someone else will be willing to pay more for it in the future. Still, an onsite live voting question about future plans when it comes to gold investing revealed that 29% of respondents plan to increase their gold holdings in the next 12 months.

With diversification from the US dollar as one of the key reasons for the recent success of gold, it has yet to be seen how the metal will fare when new challengers gain further traction, in particular the RMB and sovereign digital currencies. With the latest interventions from prominent figures like Mark Carney, in particular the latter will be the great unknown over the coming years.
Central banks facing digital disruption

The future role of digital currencies
Cryptocurrencies are a recent phenomenon, and even in the early 2010s they were only known to a small group of enthusiasts. Since then, however, the underlying concept of the Blockchain has gained widespread attention, and its most well-known implementation, cryptocurrencies, has already left an impressive mark, with total market capitalizations reaching hundreds of billions of dollars. It is therefore also possible that cryptocurrencies will play a significant role in central bank reserve management over the coming years.

Until now, however, regulatory approval and mainstream adaptation has stalled, and there are influential forces that see anonymous or unregulated payment systems critically, mainly due to their potential role in facilitating trade in illegal goods, money laundering or terror financing. Only recently, even the role of ordinary cash has been under scrutiny, and various central banks subsequently decided to cease the issuance of high-denominated bills to make a contribution in the fight against the global shadow economy. With sanctions as an increasingly used tool in the geopolitical area, pressure might increase to crack down also on innovative and emerging methods to bypass official financial channels.

Still, the concept of ‘digital scarcity’ might not yet be developed to its fullest potential, and we might have neither seen the most sophisticated implementations of cryptocurrencies yet, nor the most successful use cases. Recently, networks of large corporations (Facebook / Libra) and even more importantly, government officials, are floating ideas and concepts for digital currencies to improve existing payment systems, and even solve the problems plaguing the current monetary and financial system as a whole. Some central banks have already started projects to look into the technical and legal aspects of central bank digital currencies (CBDC), for example the Swedish Riksbank with its e-krona project.

At a speech given at the 2019 Jackson Hole Symposium, Mark Carney, Governor of the Bank of England, discussed at length if a Synthetic Hegemonic Currency (SHC) could have the potential to solve the deficiencies of the current international monetary and financial system. Carney sees a potentially ‘intriguing’ role for a SHC, which would exist as a network of central bank digital currencies. Its most important role would be to reduce the role of the USD in the global financial cycle: Trade would be less synchronized and shocks in the US would have less spill-over effects; volatility of capital flows to emerging economies would decrease and the global credit market would be less dominated by the US dollar. In the longer term, with the SHC establishing itself as a reliable store of value, there would be less downward pressure on the USD equilibrium interest rate, which would be an important step in solving the emerging global liquidity trap.

Will central banks invest in digital currencies?
According to the most recent UBS survey, a quarter of respondents believe that digital currencies will be an eligible asset class among leading central banks at some point in the future. This is quite remarkable considering that this is a relatively new asset class as discussed above.

However, a number of steps have to be taken before such a basket of digital currencies could be created. First, a number of leading economies would have to issue their own digital currencies, and local laws and regulations would have to be changed to a varying degree for that. Next, in order to be truly effective, the currency would have to establish itself in payment, but ultimately also in investment processes. The large-scale issuance of liquid sovereign or corporate debt denominated in such SHCs would therefore stand rather at the end of a long process. Only at this point central banks could consider the SHC not only as part of their FX reserves but as part of their investment portfolio.

At that stage, FX reserve and asset allocation frameworks would have to be revised thoroughly. In particular central banks with large gold holdings would be confronted with the decision what to make with these ‘legacy’ holdings.

The crypto-world will certainly experience substantial further developments, and quite a few of them have the potential to have far-reaching consequences for the role of central banks not only as regulators but also as investors. At some point in time, malicious computer programs could have their own wallets, paying for services like DDoS attacks while...
collecting ransom all at once and completely anonymously. Ultimately, new forms of corporations might develop based on this concept; think Uber without management, all run by a program that spreads globally from city to city not unlike a computer virus, paying people willing to loan an item and charging the users, all autonomously via the wallet of the ‘crypto company’. The proceeds of such (legal or illegal) activities would be paid in a potentially untraceable cryptocurrency to the holders of tokens which could be bought on regulated exchanges or on the dark web.

Should regulators including central banks ignore cryptocurrencies for too long, they might be forced to act the latest when taxable business transactions and ultimately stored wealth itself would more and more disappear from the regulated financial sector, affecting the role of central banks as guardians of financial stability. The technology also has the potential to shift investment processes and participation in business ventures into a more or less unregulated area, limiting access for central banks from a regulatory perspective, but also in their role as investors.

Central banks and cybercrime

While the digital age comes with many benefits, cybercrime will likely develop into one of the dominating risks for institutions which largely deal in bits and bytes. Recent cyber-attacks against central banks (for example Bangladesh) show that this is a current threat that needs to be tackled as soon as possible. Central banks will have to tackle cyber risk in their daily operations, in their role as guardians of financial stability and in the management of their own portfolios.

With hacking becoming more and more an activity of professional groups with implicit or explicit state support and a geopolitical agenda, harder targets will come more and more into the focus of attacks. Critical systems like the energy infrastructure of a country, but also its payment network, might therefore increasingly get into the crosshairs of attackers, even if they cannot be exploited directly for financial gains.

Regarding risks to the overall economy, while the cyberattacks of the past were still largely restricted to cyberspace, usually leading ‘only’ to the loss of personal data or other forms of information, future attacks on connected devices can directly affect people’s everyday life, reaching from pranks on smart thermostats to people getting killed by hacked autonomous cars or implanted medical devices at a large scale. These new kind of attacks would be perceived as much more serious by the public, provoking potentially aggressive reactions from regulators and creating substantial claims via class action lawsuits. In such a world, the risk that perfectly fine running blue chip companies could be wiped out overnight would increase significantly. With all the benefits that new digital technologies bring, investors and regulators have to be aware how scalable and fast risks can materialize in an all-digital world.

To make matters worse, companies that take preventive measures, e.g., in the form of redundant systems or backup facilities, might be regarded as comparatively worse capital allocators compared with peers that do without such non-revenue generating measures.

The answer has to come from investors and standard setters. We believe that central banks in their dual role as regulators and large long-term investors are ideally suited to lead by example, by adopting cyber risk countermeasures in their own operations and by developing long-term investment concepts which reward companies that invest in resilience and the long-term survival of their businesses. Central banks are therefore well advised to continue the development of their ESG capabilities, including resilience against cybercrime, where long-term thinking and governance play a key role.

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