2025 Public Sector

Perspectives

Creating a New Catalytic Asset Class

Cyber Winter: Are Central Banks Ready?

The Changing Role of Gold in Central Bank Reserve Management

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Welcome

to Citi Perspectives for the Public Sector

The past year marked a historic period of change, with voters in more than 60 countries – home to over half of the world's population – casting their ballots.[1] It was a challenging year for sitting governments: over 80% of incumbent parties experienced a decline in either seats or vote share compared to the previous election.[2] Faced with rising prices, divisions over cultural issues, and frustration with the political status quo, voters in many countries expressed their discontent.

As we head into 2025, many governments continue to grapple with these challenges. Fiscal spending is under pressure, high debt-to-GDP ratios limit flexibility, and they must navigate a more complex global geopolitical and economic landscape. These obstacles are widening the gap toward achieving sustainable development goals. Innovative, creative solutions will be crucial to addressing them.

Fortunately, public sector entities, ranging from governments and state-owned enterprises to non-governmental organizations (NGOs) and multilateral organizations, prove themselves day after day to be hugely resilient and adaptable. The public sector is often farsighted in spotting and facilitating opportunities for citizens, companies, and countries themselves, and is open-minded to enlisting the support of the private sector.

[1] https://www.pewresearch.org/global/2024/12/11/global-elections-in-2024-what-we-learned-in-a-year-of-political-disruption/
[2] https://abcnews.go.com/538/democrats-incumbent-parties-lost-elections-world/story?id=115972068

This edition of Citi Perspectives for the Public Sector celebrates progress and highlights opportunities for improvement. One article explores how private capital can use the risk-mitigation capabilities of multilateral development banks (MDBs) and development finance institutions (DFIs) to help drive global development. Multiple parties are working to establish MDB/DFI-backed transactions as a distinct asset class, paving the way for investors to participate in blended finance structures.

Julie Monaco

Global Head of
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Local currency funding is crucial for reducing risks linked to MDB hard currency lending. But, as our experts observe, in many emerging markets, limited domestic financial markets have restricted MDBs' ability to hedge or borrow in local currencies. The search has been on for a solution. Now, leveraging our global network, we can offer a stable, long-term source of local currency funding, helping MDB clients better align with development projects.

Following the recent COP29 meeting, we examine financial tools available to sovereigns for tackling climate change. Ambitious climate action will require increased private capital mobilization and large-scale financial market instruments. Some tools – such as sustainable and outcome bonds – are already accessible to sovereigns. Others, such as Debt-for-Development swaps and carbon credit markets, could have a larger role to play.

Learning from others is critical to making progress. A number of articles in this edition share best practices from around the world.

Taxation is essential for funding critical public services like healthcare, education, and infrastructure while fostering economic growth. But collection is a perennial challenge. Our article highlights best practices by analyzing the factors that influence authorities' ability to mobilize revenue. These include institutional capacity, compliance, enforcement measures, and adaptations to changes in society, such as digitalization.

We also highlight best practices for state-owned enterprises. Where once they operated mostly within national borders, many now advance national interests globally. We examine how they can strengthen their treasury management, cash forecasting, regulatory compliance, and global payment processes and adopt tools like cash pooling and supply chain management. Establishing centralized treasury units and partnering with banks with an international footprint are key steps.

Finally, we take a history lesson to illuminate future trends. Over 50 years since the US dollar was untethered from gold, it remains a key asset for central banks globally. Our article considers gold's evolving role in central bank reserve management. Central banks increasingly view gold as a hedge against volatility and geopolitical risk, and this role means the yellow metal is likely to grow in significance for FX reserve diversification.

Citi Perspectives for the Public Sector is built on our valuable client relationships. We are grateful for your insights, which help shape our coverage of your challenges and goals. As always, we welcome your feedback on our topics and your ideas for future editions.

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Development practitioners and commercial banks should first focus on MDB/DFI-enabled transactions. Using proven tools in the short-term can show investors what is possible in emerging markets and developing economies.

Creating a New *Catalytic Asset Class*

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Over US$4 trillion dollars. This the approximate annual shortfall that must be plugged if the world is to meet the objectives of the Paris Agreement and the UN's Sustainable Development Goals. Clearly, a hole of this size cannot be filled with public funds alone. Such a staggering sum is larger than the GDP of all but four countries.

Development practitioners have long hoped that private capital looking for yield might be a solution. And with good reason. The world's largest banks — those deemed to be "Globally Systemically Important" (GSIBs) — hold $66 trillion in assets, equivalent to 63% of global GDP in 2022.[1] Moreover, these banks have historically funded key development projects. Why not turn to them? This idea was endorsed at the Third Conference on Finance for Development in 2015 and formalized in the Addis Ababa Action Agenda.

Unfortunately, the desired influx of private capital has yet to materialize for several reasons. Since the 2007-2008 Financial Crisis, the world's largest banks have buttressed their balance sheets by increasing Tier 1 capital and annealing their risk and control policies to meet stricter regulatory requirements. Yet this bolstering runs contrary to the run for investment in emerging markets and long-term infrastructure projects. From a conventional perspective, deploying the large amounts of capital needed for projects in emerging markets carries significant credit risk, making banks hesitant to invest.

So how do we change this?

Blended finance is often touted as a solution to this challenge. The "billions to trillions" mantra has become a familiar refrain — a rallying cry to use public capital to mitigate commercial risk and scale up private investment. Unfortunately, blended finance faces challenges of its own. Ticket sizes tend to be small and there are a limited number of bankable projects, especially in the lowest income countries (LICs). Blended structures are also complex. There is a knowledge gap for many donors and investors. The public, private, and philanthropic sectors have different goals and limited experience working together. These barriers mean that structures combining government aid, Official Development Assistance (ODA), and philanthropic monies will take time to prove out, replicate and scale.

[1] https://www.imfconnect.org/content/dam/imf/News%20and%20Generic%20Content/GMM/Special%20Features/3Q22%20GSIB%20Monitor.pdf

How GEMs delivers insights into EM credit risk

The Global Emerging Markets (GEMs) Risk Database was founded in 2009 as a joint initiative between the European Investment Bank (EIB) and the International Finance Corporation (IFC). Today, the GEMs consortium has grown to include all major MDBs and DFIs worldwide; its database is one of the world's largest credit risk repositories in emerging markets. Contributions by members include almost 20,000 financing contracts with more than 11,000 counterparties in over 170 countries over 35 years.

Individual GEMs members submit information on credit defaults of their loans in emerging markets, how its clients' credit ratings have changed, and the recovery data on defaulted projects. This data is collected annually, anonymized, and then pooled to provide aggregate statistics on observed default rates, ratings migration and recovery rates by geography, sector, time period and various other dimensions. This data provides members with insights into geographies that are otherwise poorly served in terms of empirical credit information.

In 2020, the GEMs consortium began to publicly disseminate some of these statistics; and in March 2024 GEMs published recovery rates for private and sub-sovereign lending for the first time.

But Blended Finance does not exist in a vacuum. It sits on a continuum alongside proven products that are immediately deployable at scale: Transactions that leverage the risk defeasance tools of the Multilateral Development Banks (MDBs) and Development Finance institutions (DFIs). In fact, these transactions should be considered a catalytic asset class unto themselves by both regulators and investors, generating the demonstration effects necessary to open the aperture for the "billions-to-trillions" agenda.

Development practitioners and commercial banks should first focus on MDB/DFI-enabled transactions. Using proven tools in the short-term can show investors what is possible in emerging markets and developing economies (EMDE). This approach will encourage appetite for more complex structures in the future. While blended finance may well prove the solution to this problem in the long term, a simpler and more direct fix is needed right now.

Understanding preferred creditor status

MDBs and DFIs already deploy credit enhancement instruments that leverage their preferred creditor status (PCS). Many are also developing new tools to align with the needs of private sector financers and investors and mobilize private capital. Moreover, these organizations have boots on the ground and understand the multi-faceted risk dimensions of infrastructure and development projects in EMDE credit zip codes. They have developed world-class due diligence processes. These capabilities should give comfort to institutional investors, which typically lack this capacity at project level and are unable to carry out due diligence (especially in unfamiliar markets where they have limited resources).

There remains, however, a mismatch between risk and the perception of risk. Within the MDB/DFI product suite, there are two kinds of preferred creditor status (PCS): explicit and implicit. Explicit PCS is written into the charter of an organization and ratified by its multilateral membership. Implicit support, by contrast, is not specifically spelled out in the charter and is often referred to as a "halo" effect. It nevertheless offers protection given MDB/DFI involvement is linked via ownership structures of those with and without explicit PCS.

Regulators view the two forms of support in starkly different terms under the current Basel III framework. Explicit support is afforded a zero risk-weight whereas implicit support is not. This difference has had a negative impact on private capital mobilization.

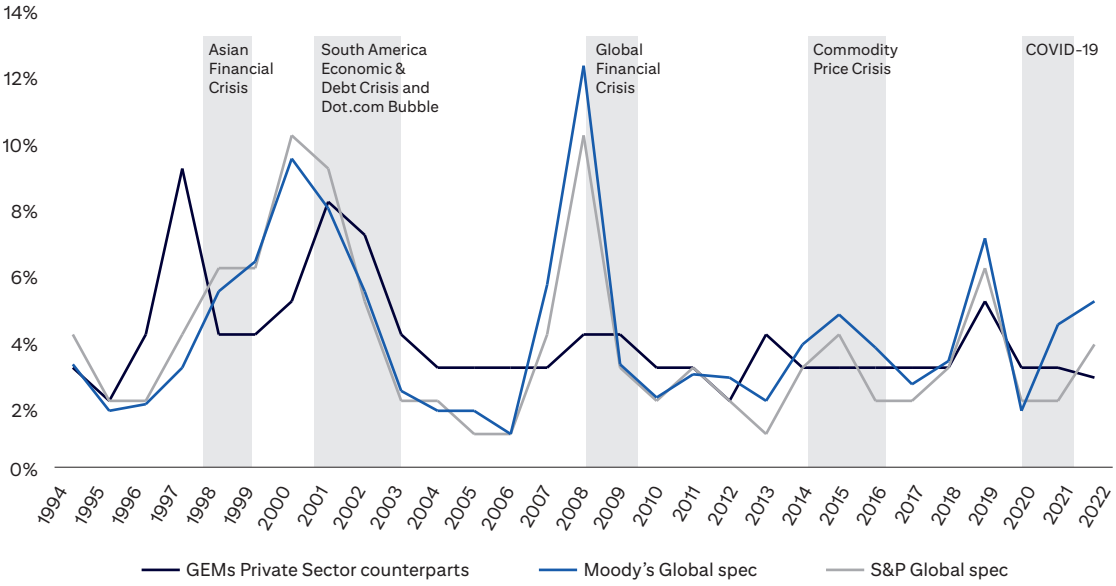
To illustrate this, it is useful to compare two World Bank entities; the International Bank for Reconstruction and Development (IBRD), which lends to public sector entities, and the International Finance Corporation (IFC), which lends to private sector counterparts. The IBRD has explicit PCS, while the IFC has implicit PCS. This distinction is common for MDBs/DFIs. Institutions focused on public sector support, such as IBRD, typically offer explicit PCS, while those focused on the private sector, such as the IFC, provide implicit PCS.

This creates a challenge. While institutions like the IBRD can help attract institutional investment for government borrowing, it is institutions like the IFC (with implicit PCS) that are key to bringing investors to private sector projects, as governments often lack the capacity and fiscal flexibility to do so on their own.

To overcome this challenge, a change in the perception of implicit support is needed. Fortunately, recent data published by a leading group of DFIs can help with this process. The Global Emerging Markets (GEMs) Risk Database (see callout box) shows that DFI-backed transactions in emerging markets – across both corporates and infrastructure projects – perform significantly better than non-DFI-backed transactions in similar geographies and projects.

What does the GEMs data show?

From 1994 to 2022, the yearly default rate for private companies in emerging markets was 3.5%, while for sub-sovereigns, it was 2.4%. This is largely in line with the default rates for B/B3 credits globally as rated by Moody's and S&P (see graph below).



Source: Gems market database

Crucially, the recovery statistics help drive home the message that investment in infrastructure and emerging markets poses less risk than assumed by current risk models, meaning commercial banks should not have to lower their risk tolerance to finance MDB/DFI-backed projects.

Significantly, GEMS data shows an average recovery rate of 74.7% for MDB/DFI-enabled loans in emerging markets. This is substantially higher than the 38% recovery rate for emerging market bonds (published by J.P. Morgan) and even the 70.1% recovery rate for global loans, published by Moody's (which is skewed by the inclusion of advanced as well as developing and emerging economies).

Recovery rates for contracts of private counterparts by World Bank Group country income group

Income Group	All	Infrastructure	Financials	Other
High	66.20%	68.30%	55.90%	67.10%
Upper-middle	75.10%	80.00%	72.40%	74.70%
Lower-middle	74.70%	78.10%	77.30%	73.00%
Low	83.50%	92.80%	90.00%	80.30%
N/A	65.20%	71.80%	55.90%	69.60%
Average	74.70%	78.70%	74.10%	73.90%
Standard Deviation	0.36	0.33	0.37	0.36

Recovery rates for contracts of private counterparts by 2022 World Bank Group region

Geographic Region	All	Infrastructure	Financials	Other
East Asia and the Pacific	69.70%	65.00%	62.90%	71.90%
Europe and Central Asia	72.50%	79.10%	73.80%	70.80%
Latin America and the Caribbean	71.70%	73.10%	65.40%	72.80%
Middle East and North Africa	82.50%	87.90%	82.60%	81.40%
South Asia	68.10%	68.90%	78.60%	63.90%
Sub-Saharan Africa	83.00%	94.30%	82.10%	80.80%
N/A	63.80%	70.50%	56.70%	66.90%
Average	74.70%	78.70%	74.10%	73.90%
Standard Deviation	0.36	0.33	0.37	0.36

Source: Gems market database

Crucially, the recovery statistics help drive home the message that investment in infrastructure and emerging markets poses less risk than assumed by current risk models, meaning commercial banks should not have to lower their risk tolerance to finance MDB/DFI-backed projects. The broader industry needs to start treating MDB/DFI-backed transactions accordingly to help unlock private sector capital for large-scale deployment. This data should help inform conversations with regulators about the reforms required to utilize these risk defeasance tools and facilitate larger-scale execution in emerging markets.

The release of the GEMS recovery data can help Citi (and other financial institutions) to improve their internal risk models. Ultimately, performance data, specifically probability of default (PD) and loss-given default (LGD) data will allow commercial lenders to correct risk models to properly account for the additionality of risk defeasance products. Recognizing that there are logistical and privacy concerns around the release of such data, we believe that commercial banks will ultimately play a role in defining the real risk of these investments, helping to overcome barriers to the use of private capital in blended structures and boosting the world's ability to meet sustainability targets.

To attract the scope and scale of capital needed to meaningfully deliver the SDGs and other development objectives, *changes to regulatory capital rules for investment in emerging markets, and sustainable infrastructure more broadly, are necessary.*

How regulations need to change

Regulatory reform that emerged in response to the Financial Crisis had many unintended consequences. Governments in the developed world used taxpayer money to create MDB/DFIs to reduce the risk of investments in EMDEs with the objective of generating economic growth and job creation onshore. At the same time, these governments tightened regulations limiting the usefulness of these MDB/DFIs and their instruments to mobilize private capital. This is the quagmire in which we find ourselves.

In common with many commercial banks, Citi's ability to lend and participate in MDB/DFI transactions is constrained by the regulatory treatment of MDB/DFI products and emerging market infrastructure.

To attract the scope and scale of capital needed to meaningfully deliver the SDGs and other development objectives, changes to regulatory capital rules for investment in emerging markets, and sustainable infrastructure more broadly, are necessary. The goal should be to ensure consistent treatment of MDB/DFI-enabled transactions across jurisdictions, as well as a recognition of the risk mitigating features of blended finance, particularly the risk defeasance tools of the MDB/DFIs and the bespoke nature of these financing products.

Basel III resulted in greater differentiation of capital treatment for various investment risks, including those inherent in EMDEs and infrastructure. The changes blurred key risk differentials between corporate and project finance, making it difficult for commercial investors to finance long-dated infrastructure assets – especially in non-investment grade countries, for unrated corporates, and in jurisdictions that do not permit external ratings. Infrastructure investments by their nature are extremely long dated, and typically bear that highest risk upfront (during construction); this is the opposite of a corporate facility risk profile.

Furthermore, Basel III failed to capture the implicit "halo effect" of instruments such as A/B loans and MIGA guarantees as these products were not deemed to provide unconditional access to foreign currency and guarantees. Differing national regulations further complicate the issue. For example, more stringent interpretation in the U.S. has served to limit risk appetite from GSIBs. Moreover, in the post-financial crisis period, banks have expanded compliance functions to meet new Basel and national regulations; many are cautious in their interpretation and application with regards to risk weighted assets.

An opportunity exists for the G20 to push for a standardization of rules and a revision to capital requirements to reflect the risk mitigation characteristics of MDB/DFI tools more accurately. If regulators, risk officers, and the market can correctly value risk defeasance and assign an appropriate capital treatment, large commercial banks will be able to finance more transition and SDG-related projects.

Building a coalition of the willing

Clearly, much work remains to be done; Citi is committed to seeing it through. We have begun to engage the U.S. Government on Basel III interpretation, specifically advocating for changes to capital requirements and risk-weighted asset treatment. We are in direct dialogue with the World Bank's Basel team on ways to modify existing World Bank products to make them Basel compliant; and there is continued engagement with the G7 and G20 to push for a standardized guarantee template that is Basel-eligible.

And we are not alone.

Moreover, a "coalition of the willing" has begun to emerge among commercial banks, insurers, asset managers and NGOs committed to promoting recognition of DFI-enabled transactions as a standalone asset class. The newly released GEMs data provides valuable evidence that transactions using MDB/DFI risk defeasance tools perform better than similar transactions that do not.

As the market begins to recognize this, we believe that the financial industry will evolve its understanding of risk and view blended finance in a new, more constructive light. Using the MDB/DFI tools will start the process: their unique mitigation features will demonstrate the risk/reward trade-offs inherent in these projects. Over time, these proven benefits will encourage investors to participate in more complex blended finance structures. In turn, increased demand will prompt MDB/DFIs to develop platforms to increase access and market standardization, which will further encourage investors to take on more clean risk.

If projects enabled by MDB/DFI risk defeasance tools come to be seen as a specific asset class by both regulators and investors, many of today's challenges could be easily addressed. With the creation of a unique, defined asset class, MDB/DFIs could become the true catalysts of global development that shareholders intended when they were created. By using their new power effectively to leverage private sector financing, the goal of billions-to-trillions in support of the Paris Agreement and the UN's SDGs could finally become a reality. ■

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To Expand Citi's reach to the very last mile in emerging economies, and support women in Citi's footprint, the first step is a gender focused investment strategy.

Financing Women in Emerging Markets: *Citi's Gender Focused Investing Strategy*

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The World Economic Forum estimates that it will take 134 years to achieve global gender parity.[1] The World Bank estimates that if gender parity were to be achieved it would add a 20% boost in global GDP to the global economic system[2].

Financial Inclusion is one of the strongest tools for advancing economic parity in lines with SDGs. The World Bank's Findex 2022[3] report identifies that only 71% of adults in emerging economies have access to a bank account in 2021, with the gender gap in account ownership at 6%. When financial inclusion is focused on women, the finance sector can target SDG 5 by providing access to finance and financial empowerment for women to achieve gender equality. To Expand Citi's reach to the very last mile in emerging economies, and support women in Citi's footprint, the first step is a gender focused investment strategy.

How does the industry define what constitutes an investment in women?

To develop greater intentionality in our business, aligned with industry standards and metrics, Citi joined the 2X movement as a partner. The 2X Challenge was launched in 2018 at the G7 summit as a commitment between global government development institutions and multilateral finance institutions with the goal of investing $3 BN in the world's women. Since then, the institution has crafted the 2X Criteria[4], the world's foremost definitions of how to select and invest in women focused opportunities especially in emerging economies. The 2X Criteria set the parameters for how to identify and frame a gender focused investment across sectors. The six point criteria can be used as a tool by the private sector to evaluate new and existing investments for gender impact.

[1] World Economic Forum Gender Gap Report 2024 Global Gender Gap Report 2024 | World Economic Forum (weforum.org)
[2] World Bank Women, Business and the Law Women, Business, and the Law 2024 (worldbank.org)
[3] World Bank Global Findex 2021 Data (worldbank.org)
[4] 2X Criteria 2X Criteria — 2X Challenge

In 2024 the G7 summit in The 2X Challenge reaffirmed the world's commitment to financing gender parity with the groups multilateral and development agencies announcing the bold new goal of supporting $20BN in 2X defined gender finance over the next three years[5]. For the first time, private capital is working alongside the development and multilateral agencies to take on the 2X Challenge. Citi via Citi Social Finance sits on the 2X Challenge board and represents the voice of the private sector to the 2X Challenge.

Citi is focused on expanding access to goods, services and importantly finance in emerging economies, and particularly expanding access to finance for women. The bank, through the Public Sector - Social Finance group, has set a goal of supporting 15 million households including 10 million women with access to life changing goods and services including finance by 2025. Through our clients, Citi has to date financed 5.8 million women across 22 countries with an average loan size of $306, indicating how deep into emerging economies the financing is able to reach.

Citi remains committed to financing gender focused investments in emerging economies, and in so doing enabling women everywhere in Citi's footprint with the empowerment through finance and access to better support themselves and their families and communities. ■

[5] G7 2X Challenge note 2024 Apulia-G7-Leaders-Communique.pdf (g7italy.it)

Citi is focused on expanding access to goods, services and importantly finance in emerging economies, and particularly expanding access to finance for women. The bank, through the Public Sector - Social Finance group, has set a goal of supporting 15 million households including 10 million women with access to life changing goods and services including finance by 2025.

Women Supported in line with 2X Principles in EM since 4Q21 ('000s)

Food Security	1,680
Microfinance	903
Access to Reliable Energy	849
Access to Water & Sanitation	841
Access to Telecom	654
Smallholder Farmer Finance	451
Access to Digital connectivity	231
SME Finance	108
Access to Cookstoves	49
Healthcare	22
Education	10
Total 2X Challenge Women	5,798

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Some financial instruments specifically addressing climate and development are available to sovereigns today, albeit at different stages of maturity and varying degrees of replicability.

Climate Finance: *What Financial Tools are Available to Sovereigns?*

Jorge Ordonez

Public Sector Banking, Sovereign Solutions and Advisory

The results of the First Global Stocktake, the most comprehensive assessment of the world's progress on climate action to date, indicates that there have been improvements. However, the world is not on track to achieve its long-term targets under the Paris Agreement. Implementation of the current nationally determined contributions (NDCs) puts global temperature rising at 2.1-2.8°C above pre-industrial levels, higher than the Paris target of "well below 2°C".[1]

Countries are expected to submit the next round of NDCs in 2025, and increased ambition is paramount to achieve the 2°C target (and especially to reach the preferred 1.5°C target). Much will depend on available financing to support climate change mitigation and adaptation investments, especially in emerging markets and developing countries (EMDCs).

The Independent High-Level Expert Group on Climate Finance determined that there is an incremental financing gap in EMDCs of $1.8 trillion per year by 2030 to meet the Paris Agreement and related development goals.[2] Some of this gap is expected to be filled by the New Collective Quantified Goal, which will replace the $100 billion pledge made by developed countries in 2009 to mobilize climate finance for EMDCs.

However, funding ambitious and decisive climate action will only be possible through higher rates of private capital mobilization and the utilization of financial market instruments at scale. Some financial instruments specifically addressing climate and development are available to sovereigns today, albeit at different stages of maturity and varying degrees of replicability.

[1] UNFCCC https://unfccc.int/topics/global-stocktake/about-the-global-stocktake/outcome-of-the-first-global-stocktake

[2] Second report of the Independent High-Level Expert Group on Climate Finance, 2023.

Sustainable bonds

The sustainable bond market has continued to grow in importance for both issuers and investors. The outstanding size of the market is now $4.5 trillion, of which over $900 billion has been added in sustainable bond issuance in 2024. Sustainable bonds issued in EUR and USD in 2024 have represented around 10% of total volumes; in the EUR market, sustainable bonds represent as much as 25% of issuance. Close to 80% of sustainable bonds come from developed markets and the most dominant label continues to be Green, representing close to 60% of all sustainable bond issuances.

Sovereign sustainable bond issuance has also increased over the years, hitting a record $131 billion in 2023, or 14% of total sustainable bond issuance that year. Sustainable bonds allow sovereign issuers to align funding with their sustainable development objectives, while diversifying their investor base and potentially achieving higher demand. Additionally, sustainable bond governance frameworks help increase coordination among ministries, transparency in the selection of eligible projects/key performance indicators, and discipline around impact monitoring and reporting.

Even though most sovereign sustainable bond issuance comes from developed markets, it is expected that more emerging markets issuers will make use of this instrument to fund climate and sustainability investments. Improved data availability, disclosure and standardization, as well as adoption of sustainable taxonomies at country level will be key to drive further investor appetite and scale the sustainable bond market in the coming years.

Outcome bonds

The World Bank has spearheaded further innovation in the sustainable debt capital market through its outcome bond program. Outcome bonds are designed to bring impact investing to fixed income investors. They generate additional financing for specific development projects while passing development outcome or project risks to the bond investor. Structures can vary but typically the principal of the bond is used by the World Bank for its general development lending activities and the World Bank is responsible for repayment of the principal amount. However, all (or a portion) of the interest income paid by the World Bank on the principal amount is directed towards the financing of the development project. Investors accept the outcome risks associated with that project and earn a return linked to the project outcomes.

Outcome bonds have the flexibility to address a wide range of development challenges and can be used to finance non-World Bank projects. The size of project financing is limited to the net present value of interest payments made by the World Bank on the principal amount of the bond, and investors benefit from the World Bank Principal protection. Examples of development projects financed in this way so far include support to COVID-19 response programs by UNICEF, conservation of the black rhino population in South Africa, the provision of clean drinking water to children in Vietnam, and plastic waste collection and recycling in Indonesia and Ghana.[3]

Debt for development conversions

Since the Belize Debt Conversion for Marine Conservation in 2021, the first where commercial debt was refinanced in a significant quantum, five other countries have closed similar transactions: Barbados, Ecuador, Gabon, El Salvador and Bahamas. These transactions allowed the refinancing of over $4 billion of outstanding debt in the market and generated close to $1.5 billion for long-term conservation and climate programs. Sovereign interest in Debt for Development Conversions has grown ever since, with the recognition that it is a valuable additional instrument in governments' toolkits that can help them achieve environmental and developmental outcomes, while partially improving debt dynamics.

Debt Conversion transactions are now being considered to address issues beyond marine conservation, such as energy, water, food security, education, among others. The US International Development Finance Corporation and the Inter-American Development Bank continue to drive credit enhancement for these transactions, but other development finance institutions (DFIs) and multilateral development banks (MDBs) are looking to deploy their guarantee products to support Debt Conversions. For example, the European Union, through the European Investment Bank, approved a $150 million guarantee to support a Debt for Climate Conversion in Barbados that will unlock resources for climate-resilient infrastructure projects.[4]

There is great potential to replicate Debt for Development Conversions at scale and market participants are devising ways to improve the structure, shorten the time to structure/execute, increase the number of credit enhancement providers, standardize processes, and generate frameworks to define development commitments and identify countries where this solution would yield the greatest benefits. The Task Force on Credit Enhancement for Sustainability-Linked Sovereign Financing launched at COP28 and joined by several MDBs, DFIs and International Organizations aims to address many of these objectives.[5]

[3] More details can be found on the World Bank website https://treasury.worldbank.org/en/about/unit/treasury/ibrd/outcome-bonds

[4] EIB http://www.eib.org/en/press/all/2024-300-inter-american-development-bank-and-european-investment-bank-approve-guarantees-to-support-climate-and-fiscal-resilience-in-barbados

[5] https://climatechampions.unfccc.int/wp-content/uploads/2023/12/Joint-Declaration-on-Credit-Enhancement-of-Sustainability-Linked-Sovereign-Financing-for-Nature-Climate.pdf

Carbon credit markets

Carbon credit markets are critical to mobilize climate finance to EMDCs. While the adoption of carbon pricing mechanisms and the growth of the voluntary carbon markets continues to be slow, there are areas of progress where governments and market participants are taking steps towards addressing some of the existing bottlenecks.

Integrity: The Integrity Council for the Voluntary Carbon Market (ICVCM) is in the process of assessing and certifying carbon crediting methodologies that comply with its Core Carbon Principles (CCP). The CCP help identify high quality carbon credits against a set of governance, emissions impact and sustainable impact principles. In June 2024, the ICVCM awarded the first CCP label to several carbon crediting methodologies and is reviewing additional methodologies that will cover over 50% of the market.[6] Complementing its work on certification, the Voluntary Carbon Markets Integrity Initiative has developed a Claims Code of Practice to provide guidance to companies on the credible voluntary use of carbon credits and associated claims.

Article 6.2: The adoption of final guidance on the operationalization of Article 6 at COP29 is an important milestone for the mobilization of capital to EMDCs. The number of bilateral agreements for governments to cooperate under Article 6.2 continues to grow. Over 30 EMDCs have signed MoUs with potential sovereign buyers to explore cooperative approaches.[7] The Republic of Singapore is a leader in this space, having signed MoUs with more than 20 EMDCs[8] to explore the transfer of high quality carbon credits for the achievement of Singapore's NDC targets. Singapore has set eligibility criteria that potential credits must meet, and an International Carbon Credit Framework aligned with Article 6 that allows carbon tax-liable companies to offset a portion of their taxable emissions using international carbon credits.[9] Wider replication by other countries of Singapore's model for the integration of compliance and voluntary markets could help boost demand for quality carbon credits from EMDCs and facilitate financing flows into the global south.

Financial innovation: Innovative financing models like the World Bank Outcome Bonds have emerged to help solve the timing mismatch between upfront investment in carbon removal/reduction projects and revenue generation from carbon credit issuance. Similarly, return-seeking investment vehicles funding projects using carbon credit spot sales and long-term offtake contracts are helping bridge the upfront financing gap. Mombak's Amazon Reforestation Fund includes investors such as CPP Investments and the Rockefeller Foundation, and offtakers such as Microsoft, and aims to enable the reforestation of large areas of degraded land in the Amazon.[10] Separately, several insurance solutions provided by the likes of Oka, Kita, AON and MIGA and others are now available to carbon credit buyers to protect against pre- and post-issuance risks, reducing some of the uncertainties associated with voluntary and compliance carbon markets.[11]

[6] ICVCM https://icvcm.org/integrity-council-announces-first-high-integrity-ccp-labelled-carbon-credits-as-assessments-continue/

[7] IETA https://www.ieta.org/resources/visualising-article-6-implementation/

[8] IETA ibidem.

[9] https://www.carbonmarkets-cooperation.gov.sg/

[10] https://carboncredits.com/mombak-carbon-removal-company-secures-100m-amazon-reforestation-fund/; Mombak https://mombak.com/news/carbon-removal-startup-mombak-begins-100m-amazon-reforestation-strategy/

[11] World Bank, State and Trends of Carbon Pricing 2024

The World Bank has spearheaded further innovation in the sustainable debt capital market through its outcome bond program.

Conclusion

Deploying climate finance at the scale necessary to keep within reach of the targets of the Paris Agreement will require an unprecedented level of innovation and collaboration among multiple actors, including governments, the private sector, financial institutions, development banks, NGOs and philanthropic institutions. This is especially the case for the mobilization of private capital to EMDCs, where macroeconomic, regulatory and political challenges are recurrent roadblocks for investment and capital inflows. Scaling up the financial instruments outlined above, developing others that include risk mitigating tools to address these challenges, and broadening the participation of relevant actors across the climate finance spectrum, are critical to help EMDCs decarbonize, and most importantly, adapt to the impacts of climate change that disproportionately affect countries in the global south.

Citi is working with its public and corporate clients to bring about innovative and collaborative climate finance solutions, in line with its goal to reach $1 trillion in sustainable finance by 2030. Citi has acted as a Global Coordinator and Bookrunner on over 85 Sovereign Green and Sustainable bond transactions since 2018, partnered with the World Bank in four out of its five outstanding outcome bonds and served as financial advisor to the Government of Belize in their Debt Conversion for Marine Conservation. Citi is leveraging its climate and sustainable finance expertise across products and its global network to continue to support the climate agenda of sovereigns around the world. ■

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Gold's attractiveness has recently increased against a backdrop of rising geopolitical and economic tensions.

The Changing Role of Gold *in Central Bank Reserve Management*

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It has been more than 50 years since the US dollar was unpegged from gold. Nevertheless, it remains a key asset for central banks around the world. Gold's attractiveness has recently increased against a backdrop of rising geopolitical and economic tensions. Will this continue and, if so, what are the implications for the distribution of gold around the world?

Gold's characteristics

Throughout human history gold's value has rested on several factors:

- It is a precious metal that has an intrinsic value derived from its malleability and scarcity. It is used for ornamental, medical, and technological applications.
- Gold shares most of the key features of fiduciary money (being able to store value and act as a means of exchange), except that it is not associated with any particular sovereign. It thus enjoys a reputation as a safe-haven asset during economic and political uncertainties, crises, or periods of inflation to preserve wealth. It has no credit or default risk.
- It has a relatively low correlation to the US dollar (or other currencies), commodities, and most financial assets. Consequently, it often acts as an anchor within an investment portfolio, helping to preserve capital and provide security.
- It has exhibited positive real returns over periods of both economic crisis and prosperity due to two uncorrelated sources of demand. About 55% of global demand is driven by jewelry and industrial/medical uses with the remaining 45% driven mainly by investment demand as a hedge against tail risks and inflation.[1]
- It enjoys a deep and liquid market, with high daily turnover including a well-developed derivatives market.

[1] https://www.gold.org/goldhub/research/gold-demand-trends/gold-demand-trends-q2-2024

Historical role of gold in monetary system

Gold has played various roles in different cultures and societies. In ancient times, gold was used as jewelry and also carried significant symbolic meanings. In India and China, for example, gold represents wealth, prosperity and longevity. Even today it is a must-have at Indian and Chinese weddings. But gold's role evolved with the external environment. The use of gold shifted from symbolic meaning to real economic value when the Egyptians and Romans were inspired by gold's characteristics to use it as their currency for trading. After fulfilling that role for several centuries, gold began to be used as the base asset for issuing fiat currencies during the 1700s. The gold standard was first adopted by Britain in 1816.

The Great Depression

During the Great Depression, people converted fiat currencies into gold to protect the value of their assets. To encourage conversion of gold back to fiat currencies and to increase the opportunity cost of holding gold, central banks around the world raised interest rates. This only served to exacerbate the Depression. Many countries could not maintain their currency peg against gold and therefore left the gold standard in a bid to save their economies (this included the UK which abandoned the gold standard in 1931). In 1934, the U.S. passed the Gold Reserve Act that prohibited both dollar redemption for gold and ownership of gold in order to maintain the dollar's peg to gold. The U.S. and France were the only countries which maintained their currency peg against gold during this period.

World War II

Prior to and during WWII, a significant number of countries sent their gold holdings offshore for safe keeping, primarily to the U.S. and the U.K. To this day, a significant amount of some countries' gold reserves remain held in the vaults of the Federal Reserve Bank of New York and the Bank of England. However, this is changing due to several factors discussed later.

Bretton Woods System

The Bretton Woods System was set up in 1944 by 44 countries as the world sought to rebuild the stability of international financial system after World War II. Gold became the heart of global monetary system as it, in effect, became the underlying asset for most of the world's currencies. The majority of the world's currencies were pegged to the dollar while the dollar was pegged to gold and was freely convertible. Due to a variety of factors, countries increasingly converted their USD holding for gold in the 1960s and early 1970s. This ultimately led U.S. President Nixon to suspend dollar redemption for gold in 1971, marking the abandonment of the currency peg and presaging the end of the Bretton Woods System.

Reduction of gold holdings

The Great Moderation from the mid-1980s to 2007 was a welcome period during which economies grew at almost their full potential rate with relatively low inflation and interest rates. In addition to the positive macro environment, the world order was characterized by an openness to trade, international cooperation, and the rise of globalization.

Consequently, gold prices fell from a high of around $850 in 1980 in nominal terms to a low of $284 in 1990.[2] With the decline in global inflation and a perceived reduction in the need for safe-haven assets, particularly after the end of the Cold War, central banks began to re-evaluate the need and size of their allocation of FX reserves to gold.

Central banks became net sellers of gold during the 1990s and early 2000s. This was highlighted by the decision by the Bank of England to sell more than half of its gold reserves in 1999. It was an attempt to diversify and invest in interest yielding assets particularly those that were denominated by the then newly-launched euro. While politics may have played a role in this instance, the sale also showed the change in sentiment towards gold. For the first time in more than a century, gold appeared to have become peripheral in the monetary system.

Role of gold from the global financial crisis to post-COVID era

Beginning with the burst of dot-com bubble in 2000, sentiment towards gold began to shift. Gold prices began to rise sustainably after the 9/11 attacks on the World Trade Center as investors perceived greater geopolitical risk and grew more skeptical about the sustainability of the strong global economy. The global financial crisis in 2007-08 completely shifted the outlook and price for gold. Investors, including central banks, clamored for the safe-haven characteristics of gold. Consequently, beginning in 2010, central banks once again became net purchasers of gold.

During the 2010s there were a series of crises and developments that sustained central banks' consistent purchases of gold. Events including the Eurozone debt crisis (2010), U.S. sovereign debt downgrade (2011), US-China trade war (2018), and COVID-19 (2020), prompted central banks around the world to keep interest rates at very low levels for a long period of time.[3] Interest rates being at historical lows, and even nominally negative in some instances, made the opportunity cost of holding gold low and easy to justify. Market dynamics added to the incentives to purchase gold. After reaching a low of $1,049 in December 2015, gold prices continued to move higher, creating returns that investment-grade fixed income assets could not match during the same period. This made gold an increasingly attractive and important part of central banks' portfolio.

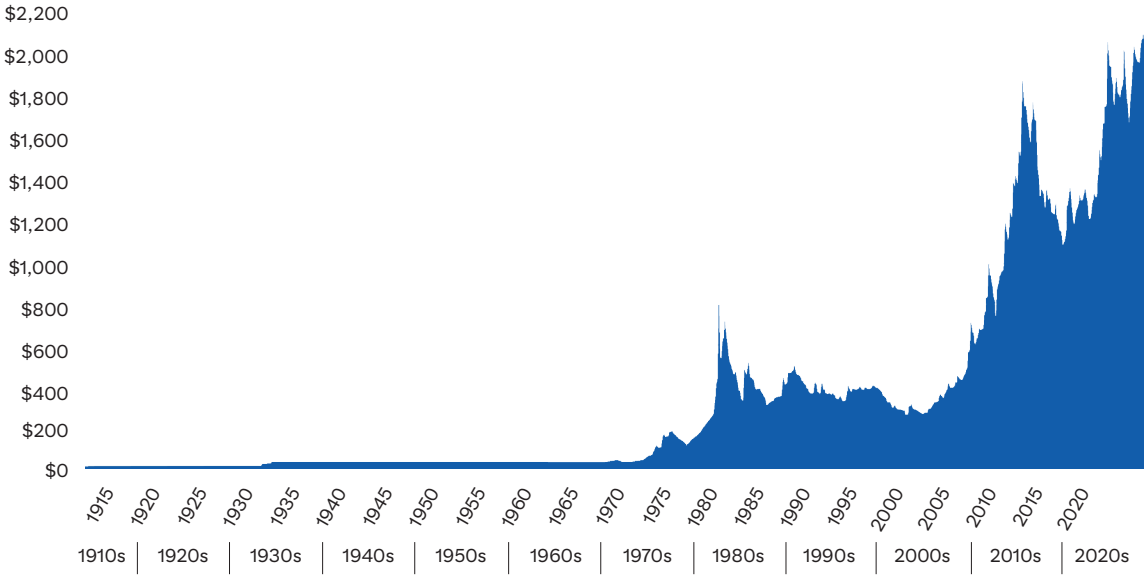
[2] https://www.investing.com/commodities/gold-historical-data

[3] https://sprott.com/investment-strategies/physical-bullion-trusts/the-case-for-gold-in-crises-2024/

Return of geopolitical risk

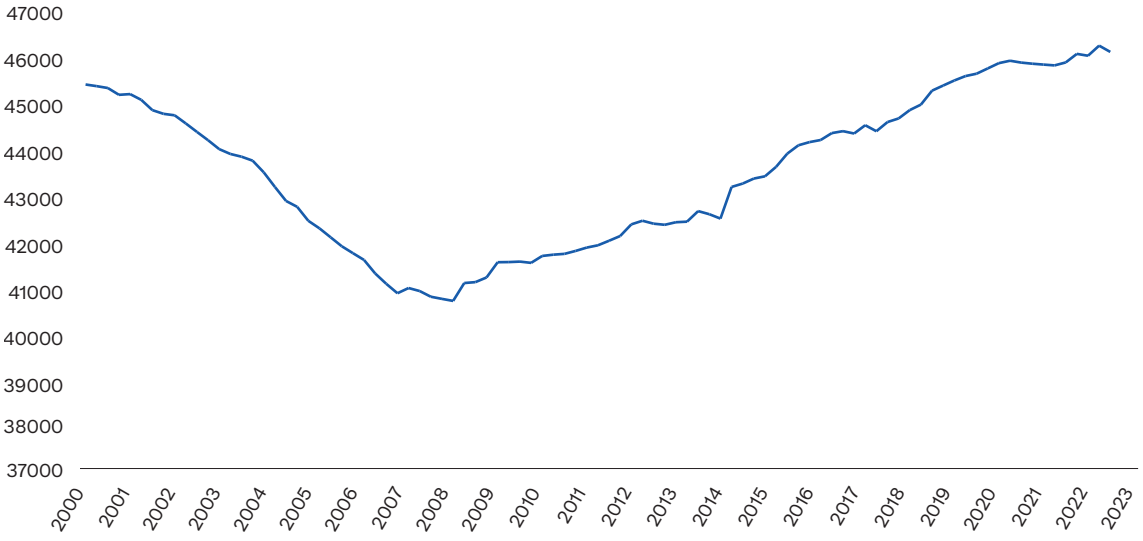
The outbreak of COVID-19 created complicated geopolitical tensions. Soon after, geopolitical risks were heightened further by the outbreak of Ukraine-Russia war in 2022, boosting central banks' demand for gold in turn. As the West imposed sanctions on Russia, countries which were willing to continue to trade with Russia, notably China, India, and Turkey as well as the countries bordering on Russia, saw increases in their gold reserves. The use of gold as a medium of exchange is something not seen on a significant level for many decades. It may become a new trend as sanctioned countries face growing challenges in using the mainstream financial system. Continuing geopolitical tensions and uncertainty concerning the Ukraine-Russia war, heightened tensions in the Middle East and growing frictions in Asia have added to the allure of gold as a safe-haven asset.

Chart 1. Historical price of gold (US dollars per troy ounce)



Source: Investing.com[4]

Chart 2. Central banks' gold holdings (World total in tonnes)



Source: World Gold Council[5]

[4] https://www.investing.com/commodities/gold-historical-data

[5] https://www.gold.org/goldhub/data/gold-reserves-by-country

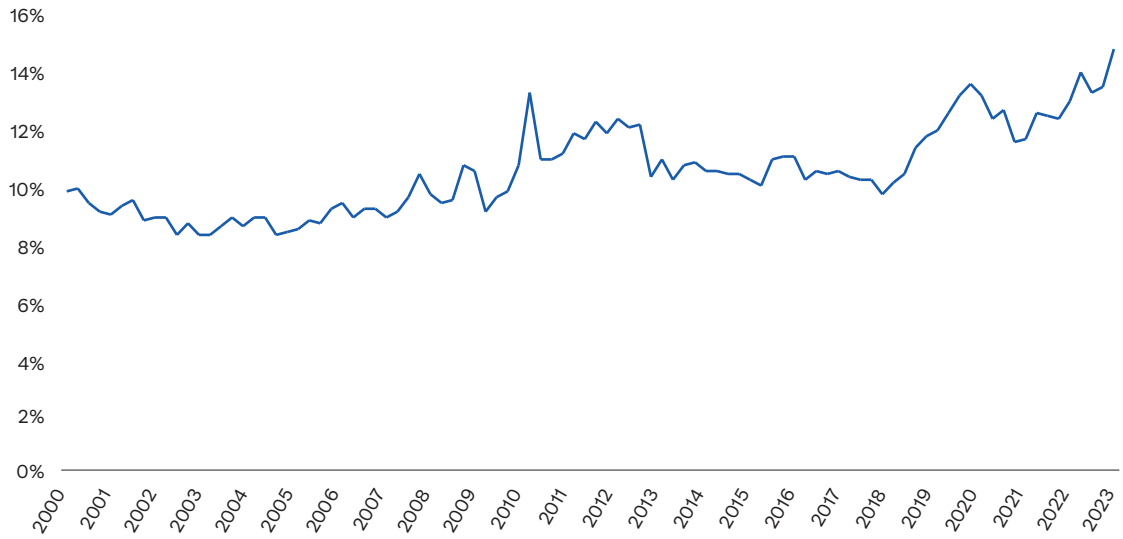
Gold's future role in the monetary system

Geopolitical events around the world have laid a solid foundation for gold to become prominent once again in the reserve portfolios of central banks, and/or as a way to settle payments for some countries. As geopolitical risks rise, various countries are setting their own restrictive rules for engagement, creating challenges for the financial system and cross-border trading, and raising concerns about holding offshore assets. Increasingly, central banks are holding gold as a hedge against volatility and geopolitical risk. This will continue to enhance gold's role in the monetary system.

De-dollarization

One of the factors contributing to the rise in the price of gold and its increasing attractiveness for central banks is reduced investor confidence in the U.S. dollar. The U.S. dollar's share of foreign reserves held in central banks has been declining; gold has benefited from the trend, thanks to the absence of sanction risk. The value of gold does not depend on the commitment of any single sovereign, enhancing its attractiveness for central banks. However, it is important to consider USD holdings within FX reserves in an historical context. Since USD became a floating rate currency in 1974, it has represented as much as 80% of global reserves (in 1977) and as little as 51% (in 1990). Current holdings of USD as a percentage of total FX reserves, at about 60%, are roughly in the middle of the 50-year range.

Chart 3. Proportion of gold in total foreign reserves (Global average in percentage)

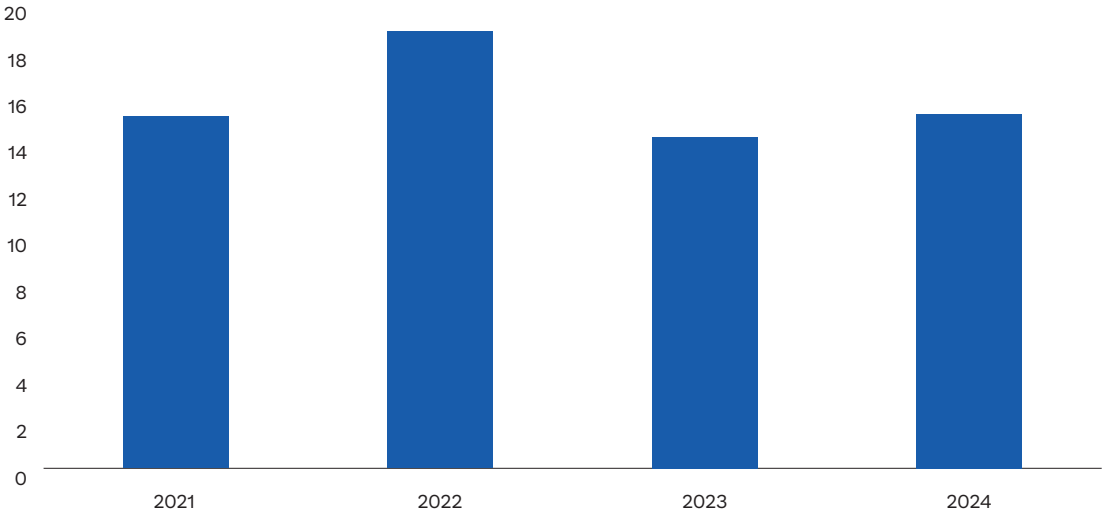


Source: World Gold Council[5]

Returns

Gold has proved to be an attractive investment. Returns from gold over the last 20 years have been just slightly lower than S&P 500. Gold also has lower volatility and consequently a higher Sharpe ratio. The rise of gold-backed ETFs caters to this demand, giving investors liquidity and the ability to trade in small sizes, while still having the comfort of physical gold being held on their behalf.

Chart 4. Proportion of central bank respondents which expect to increase allocation to gold (In percentage)



Source: OMFIF[6]

Location of gold holdings

With geopolitical risks being one of the drivers for holding gold in foreign reserve portfolios, history highlights that the location of gold storage is an important consideration. This was amply demonstrated prior to and during WWI and WWII when significant amounts of gold were shipped to the U.S. and the UK, where much of it still remains. However, this is changing. Physical security and access to a country's gold are increasing concerns. The trend began about a decade ago when some central banks decided to move some of their gold holdings back from the U.S., the U.K. and France. Among those countries publicly announcing gold repatriation between 2014 and 2020 were Australia, Austria, Belgium, Germany, Hungary, Netherlands, Poland, and Romania. The issue gained greater focus when the G7 countries froze Russia's FX reserves following Russia's invasion of Ukraine in 2022. Concern intensified when the G7 countries decided to use frozen Russian assets to fund Ukraine's reconstruction efforts.[7] Since 2022 countries have increased their repatriation, highlighted by India's announcement in 2024 that it repatriated about 100 tons of gold back to India from the UK. A recent study shows that 68% of central bank respondents keep their gold onshore, compared to roughly 50% in 2020.[8]

[6] https://pdf.omfif.org/view/v_4QBoeNP

[7] https://neighbourhood-enlargement.ec.europa.eu/news/first-transfer-eu15-billion-proceeds-immobilised-russian-assets-made-available-support-ukraine-today-2024-07-26_en

[8] https://www.invesco.com/content/dam/invesco/igsams/en/docs/Invesco-global-sovereign-asset-management-study-2024.pdf

A handful of countries keep all their gold onshore, including (according to reports) the U.S., U.K., Russia and China. Nevertheless, most countries continue to hold some of their gold reserves offshore for three reasons:

- Offshore gold vaults offer better security.
- Insufficient facilities for storing all their gold in their home countries.
- Storing gold in countries with developed gold market facilitates allows trading and other market activities.

The above explains why a significant portion of global gold reserves continue to be stored at the Bank of England and Federal Reserve Bank of New York. London and New York are international gold trading centers. Storing gold in London and New York allows it to be easily lent out or executed in different forms of gold trades. All these characteristics have encouraged central banks to place at least part of their gold reserve in London and New York. Shanghai Futures Exchange and Shanghai Gold Exchange, which were established just over 20 years ago, are becoming more prominent in the gold trading market. However, they have their own challenges when compared to markets in London and New York, including a limited product offering, a relatively small gold lending market, and the limited participation of international banks and gold dealers, among others. However, for countries not allied to the West and looking for diversification, these Chinese exchanges offer an attractive alternative.

Chart 5. Current top central bank holders of gold

Ranking	Countries	Tonnes	% of Total Foreign Reserve
1	United States	8,133.5	73.2%
2	Germany	3,351.5	72.5%
3	Italy	2,451.8	69.2%
4	France	2,436.9	70.9%
5	Russia	2,335.9	30.3%
6	China	2,264.3	5.1%
7	Switzerland	1,040.0	9.1%
8	India	846.2	9.8%
9	Japan	846.0	5.4%
10	Netherlands	612.5	62.9%

Source: World Gold Council[5]
Note: Data as of July 2024

The distribution of gold holdings may also become more disbursed, away from the traditional, i.e. "western", financial centers, *to increasingly reflect the changing geopolitical landscape.* In effect, gold has become a growing part of a *longer-term strategy for diversifying FX reserves.*

Conclusion

Gold's value is intrinsic; it is not tied to any single sovereign entity. As a result, it is increasingly seen by central banks as a hedge against volatility and geopolitical risk. Given that these risks remain elevated, gold is likely to continue to become a more significant part of central banks' portfolios to preserve value and, if necessary, a means of exchange. The distribution of gold holdings may also become more disbursed, away from the traditional, i.e. "western", financial centers, to increasingly reflect the changing geopolitical landscape. In effect, gold has become a growing part of a longer-term strategy for diversifying FX reserves. ■

The question is not if we will be cyber victims, but when. This paradigm shift leads us from pure prevention towards detection and response measures.

Cyber Winter: *Are Central Bankers Ready?*

Jay Collins

Vice Chairman of
Banking & Public Sector

A cyber winter has been coming for a very long time. I delivered a speech to a group at the U.S. Department of Homeland Security on the evolution of the cyber threat. This is an excerpt:

"The reality of the digital era is that hacking is now a service… IT outsourcing service providers create new vulnerabilities, as do SME service providers to governments and large corporates. Blackhole malware toolkits delivered through software-as-a-service target our networks. Mobile device hackers target the weakest links in the chain, a chain through which citizens and customers increasingly utilize personally identifiable information (PII) and execute financial transactions…The newest technologies, from near field communication (NFC) to location-based capabilities, act like a lightning rod for cybercriminals. Nation-state actors are able to fund the modern-day equivalent of a nuclear arms race. Single-tier traditional perimeter security systems are today's Maginot Line. Supervisory control and data acquisition (SCADA) industrial control systems for managing chemical facilities and public utilities have blurred the lines between cyber and physical security. Hardware is as vulnerable as software. Networks controlling financial markets and hospitals are under siege. Tier V and VI attackers have redefined 'fat tail risk' not just for the financial system but for the entire economy. And the red teams are winning."

I gave that speech in July 2013 – more than a decade ago! It should send shivers down your spine at how long we have been discussing cyber winter. At the time, the message was a warning, a call to action. Five years later in 2018, as the situation had only worsened, I gave another chilling speech to government officials called "Preparing for Winter," where I warned:

"The threat has surged, not diminished; cyberattacks have accelerated in frequency and breadth of impact; and successful, material breaches are commonplace. Actors disrupt and destroy, they demonstrate patience and deceptive capabilities, they increasingly commit cyber-enabled extortion and espionage, and they are consistently attacking applications and mobile devices, demonstrating an accelerated and focused ability to compromise business email to commit financial crime, fraud and extortion…One of the most troubling trends is the persistent and dramatically increased role of nation states in cyberattacks against other states and increasingly the private sector…We now live in a world where, as a government or financial institution, we are in the zone of greatest incident concentration. The question is not if we will be cyber victims, but when. This paradigm shift leads us from pure prevention towards detection and response measures."

This article has been edited and updated from a speech delivered in May 2024 to central bankers from around the globe at Citi's Annual Central Bank Seminar.

Today, more than five years since I said "bundle up," the blizzard has arrived. Let me describe what we are seeing today, and every day that signals that winter is upon us, and the global central bank community:

Sign one: Attacks are simply unabated across sectors

The speed, breadth, damage level, and variability of cyberattacks continue to surprise even the experts. Multi-national manufacturing giants can be forced to shut down food production; pharmaceutical giants can have their distribution disrupted; car manufacturers can lose the PII of thousands of employees; software firms can have client data compromised; and banks can have ATMs, mobile banking, and branches compromised. From airlines to biotech, no sector is immune from having large quanta of customer data exposed, reputations damaged, and operations shut down.

Sign two: Geopolitical and the nation state elephant in the room

Recently, I asked a minister of finance of a large country what economic and financial challenges keep him awake at night. The minister replied, "They are all geopolitical." Remember, this was a finance minister, not a minister of foreign affairs or defense. The minister's answer captures one of the greatest paradigm shifts of our new cyber world: Everything is geopolitical at the core. Economic, finance, and technology issues can no longer be addressed in a silo. While the other types of cyber actors aren't slowing down, the nation state actors are clearly operating in hyperdrive.

The full-scale invasion of Ukraine changed things. In fact, Ukraine changed everything. Nancy Pelosi's trip to Taiwan also changed things. Then Gaza changed things. It put nation state actors in the center of development, climate, technology, capital flows and, of course, in the center of the cyber room. Nation state actors are well funded; they have access to significant resources and cutting-edge technology; they are not deterred by law enforcement; and they are outsourcing specialized activities to sub actors. We are also seeing nation state actors employ the tactics, techniques, and procedures (TTPs) of hacktivists, known as "faketivism."

Sign three: From "phishing minnows" to whaling

Attack vectors have evolved from broad-based phishing to targeted "spear-phishing" to now, what is being called "whaling." The term "whaling" is used to describe when a C-suite or empowered senior corporate executive is methodically and systematically selected and targeted by a combination of electronic and human assisted phishing campaigns, that often leverage GenAI to create complex, social engineering schemes. This combination approach is often referred to as an "interactive intrusion technique" whereby the adversarial machine can be aided by human creativity to boost the success of attack outcomes.

Sign four: Generative AI, perfection and advantage to offense

I remember asking a question to U.S. Cyber Command a few years ago about who wins in an AI world – the offense or the defense. I remember the answer clearly: "We hope that the advantage will be to the defense." Yet with GenAI in the public domain, that is not what we are seeing.

Instead, we see AI perfecting the adversary's language communication to make it indistinguishable from human capability—in any language. We can no longer rely on the traditional clues to spot a cyberattack, like nonsensical phrases, easy misspellings, or grammatical errors, as we had become accustomed to in the previous era of business email compromise attacks. Although threat actors have not deciphered how to use AI for intrusion operations, they have cracked how to deploy GenAI for various cybercrimes at different stages of attack. Some examples include developing and improving stealer malware, helping to manage infrastructure, and by leveraging open-source information and tools to create highly tailored operational plans for threats like ransomware. Malware developers are even learning to leverage AI to make subtle code changes that evade signature-based detection. Overall, the emergence of AI has provided cybercriminals powerful tools to carry out attacks with greater efficiency and sophistication. We are in a race between organizations and cybercriminals to see who can adopt AI as quickly and effectively as possible.

Sign five: The cloud as the target of the day

Cloud intrusions are a new focus area for a wide range of adversaries—from nation-state actors to cybercriminals – as more entities increasingly adopt cloud solutions, especially for data storage. Cloud servers are the target of the day with service providers facing cloud tunnel exploitation and cloud software hacking. Attacks on the cloud environment have motivated threat actors to be more persistent, an increase in the ability to move laterally and an increased ability to exfiltrate data.

Sign six: Back to identity basics

The threat actor focus on credentials and identity targeting has also surged. Techniques like brute force, credential surfing, targeting of tokens, session cookies, and password spraying are helping cybercriminals to compromise a myriad of credentials at a high attack outcome success rate. SIM swapping has taken identity risk to a new level.

One broken identity link in the chain enables a device to be ported through a telecommunication company's help desk, which is exactly what the threat actor wants in this new attack. By creating an additional identity factor breach, the device identity is compromised which starts a domino effect across the vulnerability landscape. This can have profound consequences for an individual who has synced account authentication steps to that compromised device. With SIM swapping, the usually reliable device identity, and its role in the multifactor identity world, will have to be carefully monitored if not modified. Adversaries are targeting cloud secret code managers, changing administrator policies, and then adding an access key to block and takeover a target's personal accounts. Financial institutions must prioritize broad-based identity protection like never before.

Sign seven: Supply chain and network vulnerabilities

This has been the year of supply chain vendor attacks, having seen a sharp increase in the exploitation of trusted software and software vendors at pace with the rapid expansion and increased interconnectedness of global supply chains. Oftentimes, third-party vendors are vulnerable because they tend to use off-the-shelf components, third-party application programming interfaces (APIs), open-source code, and multiparty proprietary code. As the supply chain expands the threat expands exponentially.

Another vulnerability in the supply chain is network peripheral devices. Cybercriminals are targeting back-up storage, virtual private networks, firewalls, and mobile phones, which are easier to breach than a managed laptop or workstation. For example, in 2023 there was a 50% increase in zero-days exploits in-the-wild[1] and 1,500 more common vulnerabilities and exposures disclosed compared to 2022.[2] There was 180% increase in the exploitation of vulnerabilities as the critical path action to initiate a data breach, almost tripling the numbers observed in 2022.[3] Cybercriminals also setup URLs that are easy to confuse with legitimate ones to create covert watering holes for high-tech eavesdropping on poorly protected Wi-Fi hotspot hubs in airports and hotels, making these sites extraordinarily attractive to cybercriminals. It is critical for us to prioritize finding secure solutions to unmanned networks and internet exposed services.

Sign eight: The new "cyber everything-as-a-service" model

Trendy new business models are being developed and deployed without strenuous security and vulnerability testing, which is propagating a ransomware as a service impact when developers sell ransomware code or malware to other hackers or "affiliates," who then use the code to initiate their own attacks. These 'name and shame models' are popular with cybercriminals, allowing them to capitalize on the stigma of being breached. Regulatory disclosure measures have been taken with public companies being required to disclose material cyberattacks to the Securities and Exchange Commission (SEC) within four business days of the incident.

Sign nine: Damned if you do, and regulatory disclosure consequences if you don't

Given the breadth of ransomware acceleration, and the pace and scale of the use of name and shame tactics, U.S. and other regulators are intensifying their disclosure requirements, such as reducing the window of time firms have to disclose a breach. Although regulatory entities might perceive reporting details of an attack within four days as beneficial to the market, it can place another target on a victim's back who has not fully recovered from the initial vulnerability. In a world where AI expedites advanced malware generation, efficiency of research, and adversarial operations, exploited institutions have less time to respond, patch vulnerabilities and prepare for disclosure.

Adversaries are targeting cloud secret code managers, changing administrator policies, and then adding an access key to block and takeover a target's personal accounts. *Financial institutions must prioritize broad-based identity protection like never before.*

[1] https://blog.google/technology/safety-security/a-review-of-zero-day-in-the-wild-exploits-in-2023
[2] https://www.infosecurity-magazine.com/news/2023-26000-vulnerabilities-97/
[3] https://sentrybay.com/180-surge-in-vulnerability-exploitation-threatens-cybersecurity

In a world where AI expedites advanced malware generation, efficiency of research, and adversarial operations, exploited institutions have *less time to respond, patch vulnerabilities and prepare for disclosure.*

Sign ten: Quantum is coming

Remember when I said that Ukraine changed everything in the cyber landscape? Well, quantum computing will likely be more disruptive to how you perceive and interact with the world around you than the impact of AI and the Ukraine geopolitical disruption combined! While the technology is still being developed, the potential of quantum computing will rapidly increase the likelihood of data breaches with potential intellectual property theft, such as when advanced persistent threat (APT) groups and criminal organizations try to exploit the vulnerabilities in current cryptography used to secure electronic communication.

A lot of valuable and sensitive information is currently encrypted with non-quantum resistant algorithms. This means that companies responsible for critical infrastructure, such as financial services, will be particularly vulnerable to future breaches. Information security professionals are dreading "Q-day" – the date when quantum computers make current global encryption methods useless. This event would be equivalent to a cyber blizzard, much worse than any winter. Machines vastly more powerful than today's fastest supercomputers would be capable of cracking codes that guard current public encryption systems, like those that secure bank accounts, financial markets, and critical infrastructure. You do not need to look much further than IBM's Kookaburra processor to catch a glimpse of how close the ominous Q-Day may be. To describe this world, I think Booz Allen Hamilton said it best when they described it by asking, "what does chaos look like?"

Do I have your attention yet? Do you feel the wintry chill? Now let us review how Citi has prepared for the evolving cyber threat landscape and how you, the central bank community, can also better prepare.

Here is a twelve-point list to review and consider that will better help you ensure that you, as central bankers, are as ready as you can be for today's cyber winter:

1. Consistently monitor, on a dedicated basis, the typologies of ongoing cybercrime

While cyber actors are diverse in origins, motivations, and objectives, they share similar tactics and quickly replicate techniques. It is crucial that central banks similarly compare notes with one another, and with official sector partners in their circle of trust. The speed at which you identify typologies is mission critical to ensuring that threat actors are understood broadly, and defenses are systemically designed and applied.

2. Incident detection and response is as important as preventative measures

The average time between a hacker infiltrating a system and the target detecting the breach is approximately six months. That means, an adversarial hacker who enters through a business email breach may have horizontal access to snoop inside a multi-dimensional, complex operating environment for months before taking any action. During the period that hackers are roaming undetected, they are able to monitor confidential data such as financial and economic data, regulated firm information, policy plans, personnel documents, and payment processes to gain strategic

intelligence for a planned attack. Imagine a hostile force inside your central bank for six months – the mere thought should make you very afraid. In an age where malicious penetration of a central bank or regulated financial institution is almost a certainty, early detection of any penetration and effective responses are critical to mitigating the forms of potential damage – financial, reputational, or otherwise.

Note: Even with advancements in GenAI, cyberattacks can still be spotted by human detection. For example, employees can identify anomalies such as wires to unusual places for unusual amounts as a red flag behind a cyberattack. Hence, the human quotient is important. Not all of your investments in cybersecurity should be high-tech and capital-intensive; there should be strategic focus on how people and processes play into your cybersecurity ecosystem. Citi continues to focus on attracting the best, experienced cyber talent as well as following industry best practices and processes, and continuously improving on them.

3. Use your full tech toolkit to fortify your cyber defense

Yes, big data, cloud computing, APIs, post-COVID-19 remote/work from home business models, the Internet of Things, and more, have ushered in a new age of cyber vulnerabilities. As suggested before, GenAI is a major disruptor of the cyber paradigm, particularly when leveraged by nation-state actors. But cutting-edge technology can also be harnessed by firms to play defense, too. The circle of trust tech world is delivering new cyber resilience tools every day to do just that. For example, at Citi, we have the AI capability to mine massive amounts of proprietary data inside our network of client data lakes to find anomalous transactions and to strengthen our algorithms against anomalies. Another notable example originating from Citi's Dublin Innovation Lab has built capabilities to review payment data and, in a non-rule-based environment, to locate outliers or anomalies of any kind. These tools and more have broad-based application in financial crime, anti-money laundering, countering the financing of terrorism, fraud, and cybersecurity.

This is how Citi uses an integrated approach to leverage the strength of technology and human reasoning in cyber defense: when AI, tuned by shared lessons learned and insights from institutions that have suffered cyberattacks, detects an anomalous transaction, response teams can investigate and fine-tune their algorithms and models set up on "search-and-destroy" missions to find malware and criminal intrusions.

Considering the continual evolution of the cyber threat, it is incumbent on central banks, governments, and financial firms to invest in robust security policies and capabilities. Now, as we have advised many of our central bank partners, we encourage investment in a GenAI partner that can assist as you navigate the numerous challenges and opportunities presented by this emerging technology. The Cybersecurity and Infrastructure Security Agency (CISA) encourages every technology provider to take ownership at the executive level to ensure their products are secure by design.

Note: "Secure by design" principles should be implemented during the design phase of a product's development lifecycle to dramatically reduce the number of exploitable flaws before they are introduced to the market for broad use or consumption.

4. Invest in industry partnerships and cooperative mechanisms and protocols

It is common for cybersecurity teams to share information within frameworks of pre-established protocols and defined circles of trust. As the NotPetya cyberattack demonstrated several years ago, networks are only as strong as the weakest link. Even if your organization has a robust cybersecurity system and is fortified, if your vendors, partners, or counterparties have cyber vulnerabilities in their critical infrastructure, then you are at risk cybercriminals are adept at identifying security gaps. Since copycat attacks are common, it is essential for central banks to explore appropriate, legal, and compliant cooperative mechanisms and protocols that enhance your strategy to withstand the cyber threat. We all must be proactive about cybersecurity, which means proactively building security in central banks before the next major attack.

Official cyber capacity and protocols for public-private collaboration including central banks are essential. The U.S. financial services industry accomplishes this through the Financial Services Information Sharing and Analysis Center (FS-ISAC), a highly relevant non-profit organization for many of you. This collaborative is an impartial resource for sharing cyber and physical threat intelligence between the public and private sectors and amongst private-sector firms. FS-ISAC, launched in 1999, is a member owned-and-operated non-profit entity with the mandate to protect the critical infrastructure of the international financial services sector. Cooperatives like FS-ISAC are essential for information sharing. For example, FS-ISAC hosts an information sharing portal where indicators of compromise (IOCs) and other threat data are shared multiple times daily It is a strength in numbers, force multiplier for combined security of the entire financial services industry. Similar coordination models among central banks and their ecosystem are critical. FS-ISAC holds a series of tabletop exercises in partnership with the U.S. Treasury's Office of Cybersecurity and Critical Infrastructure Protection to help organizations learn to prevent and respond to data exfiltration by a malicious insider and coordinate with public and private sector partners to address it.[4]

Another example of industry cooperation is the Analysis and Resilience Center (ARC). A U.S. organization, originally formed out of the FS-ISAC members, that consists of the most sophisticated cybersecurity-capable firms. For its members, the ARC promotes the dissemination of the latest intelligence information via calls and email. Members are invited to report notable observations from their cybersecurity operations centers, but all information is anonymized to prevent reputational damage.

In the context of the FS-ISAC and ARC, financial institutions and governments are partners, and the relationship promotes collaboration and creates a robust channel to exchange communication. As simple as these engagement models seem, the readiness to share information, establishing an appropriate channel to do so, and the broader forum in which to speak openly are each a mindset, habit, and institution that enhance cybersecurity.

FS-ISAC is also a tested, resilient platform to coordinate responses to a cyber emergency.

Citi is a founding member of the FS-ISAC/ARC and has been at the forefront of developing robust cyber defenses. Because Citi has a physical presence in nearly 100 countries, supports businesses in 160 countries, and serves millions of customers worldwide, our cyber defense, resilience, and response capabilities are vital to our reputation as an industry leader in this space. Furthermore, as a founding member of the Cyber Risk Institute (CRI) and the employer of the current Board chair, Citi understands the importance of resilience and highlights this across our programs. We use the CRI profile, designed by financial institutions, which is the National Institute of Standards and Technology (NIST) Cybersecurity Framework plus third party and governance guidance.

As a cornerstone of the global payments system, we move roughly $4 trillion of funds daily, and on any given day that number can double in a market surge. Not surprisingly, this makes Citi an attractive target of cybercrime. Our firm is subject to an attempted cyberattack every 2 seconds, every hour of the day, every day of the year.

We are in constant dialogue with governments and central banks about platforms like the FS-ISAC or ARC for regional financial services firms, as well as about mechanisms which can improve that dialogue with and within circle of trust central banks, to establish consistent cybersecurity regulation across select countries.

5. Plan for continuity of business

If your central bank has a continuity of business (COB) plan designed for a disaster of some kind, natural or otherwise, that is great. However, let me be clear, this is not equivalent to a cyber-COB plan. Cyberattacks are different than traditional disasters. The Cyber COB should reflect the specific challenges that cyberattacks pose to your bank operations and to the financial system. It is a necessity to build cyber resiliency planning into your overall strategic plans.

[4] FS-ISAC, Hamilton Series Insider Threat Tabletop Exercise, January 2023

6. Practice your threat response and communication strategy in advance

If a cyberattack occurred today, are you clear about who needs to know what and when, among your broadly defined internal and external central bank constituencies? Are the communication channels and scenarios for your central bank clearly established and socialized with the necessary partners and stakeholders? The materiality and timing thresholds of public communication are complex and have enormous repercussions for the system and the central bank if loosely managed. You will be under enormous time pressure in an actual crisis, so your communication channels within and around the central bank must be pre-defined and well-rehearsed.

7. Robust due diligence on critical vendors

Be it power, telecom, software, or another key infrastructure service provider, we have learned how important preparation and communication with critical vendors in our supply chain is. Remember: when malware threatens, it is often through a cracked door left open by the weakest link in your chain. This is often an external supplier's system. Central banks should be digging deep into their vendors to uncover and understand any potential network, supply chain, and third-party vendor cyber risks or issues. This is not just a matter of operational risk, but also one of reputational risk, as central banks should represent expected best practice behavior.

8. Time speeds up in a crisis: Have your containment protocols set In advance

In a cyber crisis, which systems need to be shut down immediately? What are the over-arching network and financial implications of those decisions? Is the network design segmented such that non-cyber-specialist decision makers can understand? Segmentation is a best practice and cannot be properly considered in a crisis; therefore, it needs to be determined and in proper place beforehand.

Our teams have observed scenarios in which non-cyber senior decision makers had to direct containment measures in less than 30 seconds. Yes, that is 30 seconds to make a systemically significant business decision. The takeaway: You must understand your containment protocols and their full-scope impact, such that in a crisis, key decision makers have the cyber knowledge and training to make a well-informed, best-case decision at an extraordinary pace.

Hint: Mock cyber exercises are great testing grounds to practice your firm and leadership's response capabilities to a cyber crisis. If you have played the scenario out in a drill, you have a strong foundation for success.

9. Know your critical assets

For Citi, one of our most critical assets is client data. Similarly, central banks need to evaluate their assets and classify them accordingly – critical, less critical, non-critical — to help align processes and resources based on clear priorities. This is a useful exercise not only if a cyberattack lands, but also in building your cybersecurity resiliency programs. Thoughtful designation of and prioritization of your data and assets is essential.

10. Construct a cyber center, lab, or dedicated team to build your central bank cybersecurity program

I hope this tip is common knowledge and something you have already done. At Citi, we utilize Cyber Security Fusion Centers (CSFCs). The term "fusion" reflects the comprehensive and integrated approach we take to cybersecurity, as we have aggregated expertise from across necessary functions in the bank as the foundation of our cybersecurity program. We borrowed heavily from the U.S. government's "joint task force" model, based on lessons learned in crisis, dating as far back as the terrorist attacks of September 11. If you were to visit our fusion centers, you might confuse it with an official secure, state of the art, command-and-control facility. That is by design.

Citi has individual teams dedicated to functions such as identifying frauds, securing our internal networks, responding to security breaches, and monitoring the dark web. The fusion center as a concept is a "team of teams" approach, able to drive response to cyber incidents, along with driving the necessary connective tissue between functions. We maintain a follow-the-sun model, with a CSFC in North America, EMEA and the APAC regions, creating and maintaining a holistic view of internal and external threats to better prevent intrusion, detect hackers early, and coordinate effective responses on a 24/7 non-stop basis.

One critical function of any cybersecurity team is to stress test the organization's own systems to make sure they can withstand and respond to an actual threat event. We employ "ethical" hackers, who are incentivized to identify vulnerabilities in the bank's systems. We also maintain "hunt teams" trained to think like the various cybercriminals to detect system weaknesses. The CSFCs regularly conduct exercises to test detection abilities and develop effective response habits. This is an example of Citi's proactive posture towards cyber defense.

Our Fusion Centers are also conduits for information-sharing within appropriate channels and within our business ecosystem. The Centers share data, observations, and best practices with the FS-ISAC, similar groups in Asia and Europe, and with systemically appropriate central banks and governments. In this way, the financial system benefits from Citi's cybersecurity leadership, and

Citi benefits from a safer and more secure financial system environment. Moreover, in the event of an attack, the relevant officials have established relationships with our cybersecurity teams, which allows maximum trust when reaction time is critical.

We have had thousands of people from roughly 300 organizations visit our CSFCs over the past several years, including senior government officials and central bankers from around the world, CEOs, COOs, and CFOs of the world's largest companies to listen, learn, and share information.

11. Develop a consistent regulatory framework

Cyber regulation is fragmented. Regulators have a peculiar challenge trying to react and guide in a complex, ever-changing space. Standards are still in development for a number of cyber areas like incident reporting, threat assessment sharing, cloud services, data protection and penetration testing. We are all learning together. For Citi or any other global bank, this level of fragmentation and differentiation is challenging to manage.

In a recent conversation with European cyber regulators, we discussed this topic. What surprised me most was their frustration recruiting and retaining specialized cyber talent with the skills, knowledge, and capacity to deeply understand the evolving cyber complexities. There is a tremendous gap between the cyber talent supply and market demand. The World Economic Forum projects that there is a shortage of nearly 4 million cybersecurity professionals worldwide – and the gap widens every day with the burgeoning advancements in GenAI technology.[5]

12. Build cyber capacity

There are three levels of capacity-building in cybersecurity: your core team of cybersecurity professionals, your senior and mid-level central bank leadership, and your financial home country ecosystem. Citi is engaged in an aggressive effort to build capacity in our broad global ecosystem, which includes clients like you. It means collaborating with central banks, regulators, governments, corporates, and banks. It means educating our supply chain.

We are committed, not only to protecting our systems and client data to the best of our ability, but also to working with players in our ecosystem

Terms Glossary	
Application Programming Interface (API)	Software that allows different programs to communicate with each other
APT28	Advanced Persistent Threat (APT) group 28 (also known as Fancy Bear, Pawn Storm, the Sednit Gang and Sofacy), is a highly skilled nation state sponsored threat actor based in Russia
Analysis and Resilience Center for Systemic Risk (ARC)	Private sector organization designed to protect the economic and national security of the United States by mitigating systemic risk to the nation's most critical infrastructure and consists of sophisticated cybersecurity-capable firms
Brute force	A hacking method that uses trial and error to crack passwords, login credentials, and encryption keys
Cybersecurity and Infrastructure Security Agency (CISA)	Constituent part of the United States Department of Homeland Security (DHS) formed in 2018 and responsible for cybersecurity and infrastructure protection across all levels of government
Credential surfing	Credential stuffing is a cyber-attack in which credentials obtained from a data breach on one service are used to attempt to log in to another unrelated service
faketivism	Nation state sponsored hackers who breach and leak by attempting to wear a hacktivist cloak
"Fat tail risk"	Also known as a black swan or tail-risk, a fat-tail event is when something occurs that was unexpected or was thought to be so far-fetched that it was nearly impossible
Financial Services Information Sharing and Analysis Center (FS-ISAC)	U.S.-based industry consortium founded in 1999 dedicated to reducing cyber-risk in the global financial system by acting as a trusted peer-to-peer network of experts. Expanded its role to encompass physical threats to the financial sector after 2001
Indicators of compromise (IOCs)	Indicators of compromise (IOCs) are signs that a system has been compromised by an attacker. IOCs can include unusual outbound traffic, increased database activity, anomalies with privileged user accounts, suspicious registry changes, and more

[5] World Economic Forum, "Strategic Cybersecurity Talent Framework," April 2024

to understand and implement best practices of cyber resilience, hygiene, and response.

I had the honor of participating in a cyber war game at a U.S. War College. In the advanced simulation, a nation state attacked each of the U.S. economy's critical industries simultaneously. The red team adversaries won and exposed, at lightning speed, the degree of interconnectivity between industries and the cyber and physical worlds. While the loss was discouraging, it was not my biggest takeaway. My biggest takeaway was that commercial and financial C-suite professionals still lack the preparation to responsibly manage the mounting and evolving threat of a major cyber incident. Whereas war games, in a purely military context, the military decision makers – up and down and across chains of command—have been drilled, trained, and prepared for the worst incursions. The cyber call to action is now!

At Citi, we place considerable focus on developing core, non-cyber decision makers in the firm, and you should be aggressively doing the same. Our Fusion Centers maintain and rehearse cyber crisis playbooks for Citi's senior- and mid-level executives regularly. During a cyberattack, there is no time for leadership of either a central bank or a financial institution to learn their organization's cybersecurity protocols. That is why Citi educates our executives about incident response and, utilizes specific playbooks that reduce the number of decisions to avert unnecessary distractions that could inhibit an executive during a cyber crisis. This includes educating executives about the potential impacts of a cyberattack on liquidity, market, and counterparty risk. These resiliency plans go into extraordinary detail, even identifying precisely who must be on an initial incident conference call. This is just one of the many tools Citi uses to prepare for cybersecurity incidents, and it reflects our "not if, but when" attitude to cyber threats. We must always be ready, and so should you.

So, as you digest what you just read, you should be thinking about two questions: If I was given 30 seconds to make a cyber decision for my central bank, would I be ready? If not, what can I do to get myself and my colleagues ready? Winter is coming, and it is essential to be prepared. ■

Terms Glossary	
Internet of Things	Encompasses devices with sensors, processing ability, software and other technologies that connect and exchange data with other devices and systems over the Internet or other communication networks
Near field communication (NFC)	A set of communication protocols that enables communication between two electronic devices through the use of inductive coupling between two electromagnetic coils over a distance of 4 cm or less
NotPetya cyberattack	A series of powerful cyberattacks using the Petya malware in June 2017 that swamped websites of Ukrainian organizations, including banks, ministries, newspapers, and electricity firms. Similar infections were reported in France, Germany, Italy, Poland, Russia, United Kingdom, the United States and Australia
Password spraying	A form of brute force attack where an attacker will attempt logins with default passwords on many different usernames rather than brute forcing a single account with many passwords in order to avoid account lockouts
Quantum computing	Quantum computing is an emergent field of computer science harnessing the unique qualities of quantum mechanics to solve problems beyond the ability of even the most powerful classical computers. Theoretically a large-scale quantum computer could break widely used encryption schemes
Ransomware	Malicious software designed to block access to a computer system until a sum of money is paid
Session cookies or Session hijacking	The exploitation of a valid computer session—sometimes also called a session key—to gain unauthorized access to information or services in a computer system
SIM swapping	Attack where cybercriminals use a target's personal information to deceive telecom providers who "port out" and grant them control of a target's phone number. Hackers can then use the target's phone number to receive authentication token codes and compromise other systems
Spear-phishing	A type of phishing attack that targets a specific individual, group, or organization. These personalized scams trick victims into divulging sensitive data, downloading malware or sending money to an attacker
Targeting of tokens or Token cracking	Attacks that target security tokens used to authenticate users by interception or other means
Whaling	Whaling attacks are also known as "CEO fraud" or "executive phishing." They involve cybercriminals using social engineering techniques to manipulate high-ranking executives into divulging sensitive information

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More local currency lending would allow MDBs to scale operations and boost development in countries that require additional funding to grow and prosper.

Cracking the Local Currency Code: *How Innovation Can Drive a Breakthrough in Development Finance*

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Multilateral development banks (MDBs) and development finance institutions (DFIs) represent a significant source of funding for emerging market countries, providing cost efficient lending to member countries and private sector entities within them. This funding allows MDBs and DFIs to play an important role in reducing poverty and inequality, boosting economic development, and accelerating progress towards the Sustainable Development Goals (SDGs) in these countries. However, there remains a strong need for new solutions to ensure that these institutions are maximizing their scale and impact.

In April 2024, a group of leading MDBs released a joint workplan that established concrete deliverables for these institutions to address global challenges more effectively.[1] These initiatives include scaling-up financing capacity, boosting joint action on climate, catalyzing private sector investment, and more. Among these initiatives is the more effective utilization of local currency financing and hedging. In the joint workplan, the MDBs highlight the need for increased lending capacity in local currency to mitigate instability risks arising from currency fluctuations. More local currency lending would allow MDBs to scale operations and boost development in countries that require additional funding to grow and prosper.

[1] https://www.iadb.org/document.cfm?id=EZIDB0000577-986313001-135

Historically, there has been relatively little local currency lending, as most MDB lending has been in hard currencies. More than 80% of lending to low and middle-income countries by MDBs and DFIs is denominated in hard currencies, with US dollars being the most common.[2] In contrast, local currency lending has accounted for a much smaller proportion of MDBs' lending. Additionally, when MDBs do lend in local currency (which most do, to a small extent), it is often to countries that already have developed financial markets. When local currency is lent, it is also often done through inflexible products such as synthetic instruments that do not contribute to the development of financial markets.[3]

Financing projects in hard currencies creates FX risk, especially during times of volatility. Should a local currency depreciate against the lending currency, the mismatch in foreign currency revenues and obligations means that the debt burden is effectively increased, creating challenges for borrowers. Since 1971, one in eight local currencies in developing countries fell by 20% or more against the US dollar in any given year.[4] Over the same period, one in 20 developing country currencies fell more than 50%.

To address the currency mismatches and FX risk inherent in local development projects funded by hard currencies, MDB/DFIs have become increasingly focused on the need to strengthen local currency financing as part of broader efforts to foster local capital markets development. Local currency solutions help emerging market borrowers to ameliorate the volatility of debt burdens and foster a more sustainable and efficient financial environment for borrowers.

The value of local currency solutions is reinforced by today's myriad geopolitical and economic crises. Many emerging countries are challenged by the aftermath of the COVID-19 pandemic, Russia's invasion of Ukraine, and the ongoing conflict in Israel and Gaza. Supply chain disruptions and rising food and energy prices, partly due to these events, drove global inflation up to 6.8% in 2023. This led central banks throughout the world to hike interest rates to restore price stability. Although inflation is now starting to decline in some key markets, emerging market borrowers will likely take longer than advanced economies to return to inflation targets. Additionally, according to the International Monetary Fund, forecasts for global growth over the next five years are the lowest in decades.[5]

Unfortunately, despite this clear need, local currency is not readily available in many cases. For perspective, in fiscal year 2022 alone, World Bank Group (WBG) institutions approved new loans worth $104 billion; if just 25% of these loans were denominated in local currency, $25 billion would need to be hedged in the local markets to meet the needs of just the WBG entities for a single year.[6] Many emerging market countries simply do not have sufficient depth to facilitate cost-efficient hedging on a sufficient scale.

One alternative is to issue local currency denominated bonds to raise funds to lend to local projects. This approach also inevitably runs into capacity constraints in most markets. Many MDBs/DFIs also seek to maintain a fully dollarized balance sheet, meaning that even where issuance is possible, they require liquid hedging markets. At the same time, pooled capital can be hard to deploy given challenges relating to the timing and structuring of transactions.

[2] https://www.tcxfund.com/wp-content/uploads/2023/11/TCX-Proposal-for-Mitigating-FX-Risk.pdf
[3] https://www.iadb.org/document.cfm?id=EZIDB0000577-986313001-135
[4] https://www.ft.com/content/31abf598-03b0-11e9-9d01-cd4d49afbbe3
[5] https://www.imf.org/en/Publications/WEO/Issues/2024/04/16/world-economic-outlook-april-2024
[6] https://findevlab.org/news_and_event/tcx-2-scaling-up-local-currency-hedging/

While meeting client demand for local currency funding, the Local Currency Lending Solution *also helps to develop local economies and contribute to Citi's trillion-dollar sustainable finance goal.*

Citi's global program for MDB local currency lending

To reduce the risks that result from the current landscape of foreign currency-driven development finance, as well as efficiently deploy excess liquidity from its local franchises, Citi has developed and launched an MDB Lending Solution. It underwrites local currency-denominated facilities at scale, creating an opportunity for Citi's MDB partners to expand their local currency operations in emerging markets. Leveraging the local balance sheets of a global commercial bank like Citi offers the MDBs an attractive alternative for strategic on-lending solutions.

While meeting client demand for local currency funding, the Local Currency Lending Solution also helps to develop local economies and contribute to Citi's trillion-dollar sustainable finance goal. At the same time, it helps Citi to reduce balances resulting from excess client deposits in local branches that are otherwise constrained by capital limits and other local requirements. For example, Citi can reduce risk weighted assets (RWA) across its EM franchises with high sovereign exposure. Given Citi's physical presence in 95 countries, this presents a significant opportunity to more efficiently manage excess local currency liquidity.

Critical benefits for:

- MDB/DFIs:
  - A core component of MDB reform is the introduction of new MDB/DFI products and services to increase private capital mobilization. Key to this is tackling projects' FX risk.
  - By leveraging Citi's global footprint to make local currency available, Citi aims to enhance the private sector's ability to contribute to development.
- Development:
  - Having a source for local currency beyond bonds, swaps and derivatives will help MDBs meet project needs, manage FX risk and potentially lower breakage costs.
  - Formalizing a programmatic local currency lending approach has allowed Citi to better meet development finance demands from global and regional MDBs/DFIs which have demonstrated interest in local currency facilities to on-lend to local corporates and financial institutions.

Key program attributes

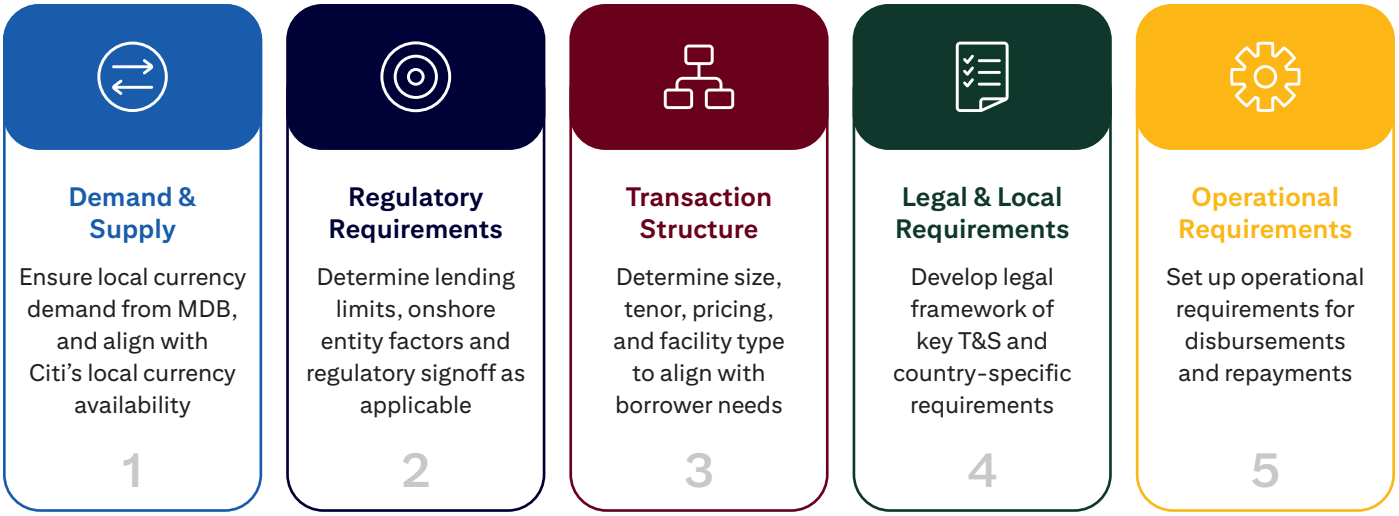
To facilitate the process of matching MDB client demand with Citi's offering for the purpose of funding specific projects back-to-back or on-lending to local corporate or financial institutions, Citi has formalized two key processes under the Local Currency Lending Program.

1. A currency card to provide indicative capacity and tenors across Citi's 30+ available currencies.
2. The development of a Local Currency Facility Agreement which contains key commercial local currency borrowing terms that underpin all lending transactions, with MDB-specific terms and conditions included up front with the goal of prioritizing privileges and immunities on all local lending arrangements.

Notable features and benefits of the Agreement:

- Flexible and customizable loan format, representations and other special borrowing procedures or conditions.
- Based on LMA guidelines with bespoke MDB terms and conditions honored.
- Affords a streamlined legal process by offering a globally consistent template that will incorporate any local terms or provisions on a country-by-country basis.
- Access to Citi counsel with experience of working on lending agreements for MDB clients.
- Potential to execute as a Multi-Currency Framework Agreement.

In addition, Citi has developed a set of key rules to help govern the loan origination and execution process from the perspective of both Citi and MDBs:



Case Study: EBRD and Citi Ukraine sign a UAH revolving credit facility to support Ukrainian clients

The EBRD operates in 39 countries across Europe and Asia, primarily investing in private enterprises. It has invested over €200 billion in more than 7,000 projects to date, offering financing through loans, equity investments, and trade guarantees.[7] Typical investments average $25 million, but range from $5 to $250 million, across sectors like agribusiness, infrastructure, and transportation.[8] In addition to financing, the EBRD supports small and medium-sized enterprises (SMEs) with on-the-ground advice to foster innovation and growth. It also collaborates with policymakers to create a regulatory environment that facilitates SMEs' success.

Over the past 10 years, the EBRD has been working increasingly with domestic stakeholders in its regions to improve the bank's access to local currencies for lending (to reduce foreign exchange risk for borrowers and improve project creditworthiness) and to support the development of domestic financial markets. As of December 2023, the EBRD has signed 1,250 local currency debt facilities in 27 currencies, totaling €18.4 billion, through senior and subordinated loan facilities, and residential mortgage-backed securities.[9]

The EBRD has been a strong supporter of Ukraine during the war with Russia, leading nearly 600 projects and deploying €4.5 billion since the invasion in February 2022. As Ukraine's largest institutional investor, the EBRD plans to continue investing €1.5 to €2 billion annually in the country and is keenly focused on the reconstruction of Ukraine's economy.[10]

In Ukraine, the EBRD wanted to provide local currency loans, both directly and through domestic financial intermediaries, to support existing and potential clients. Citi Ukraine, a branch of Citibank N.A. and a fully owned subsidiary, played a key role on the supply side. With over 25 years in Ukraine, Citi serves around 500 multinational firms, large Ukrainian corporations, as well as some public-sector and mid-sized clients. Citi Ukraine had an excess of hryvnia (UAH) liquidity and was nearing its limits at the National Bank of Ukraine. By making this liquidity available to the EBRD, it benefited EBRD borrowers, the Ukrainian economy, and Citi itself.

To enhance access to local currency, EBRD and Citi Ukraine signed a $100 million revolving credit facility in UAH, the largest of its kind between the two institutions. The funds support local businesses affected by the war, addressing liquidity, short-term working capital, and trade-finance needs, while minimizing currency exchange risks.

Matteo Patrone, EBRD Managing Director for Eastern Europe and the Caucasus, said: "This new facility will help ensure we can continue to meet the local-currency financing needs of Ukraine's private-sector businesses within these levels. This is particularly essential during this time of economic uncertainty."

This collaboration between the EBRD and Citi Ukraine marked Citi's inaugural transaction of its Local Currency Financing Solutions initiative for development finance institutions, and was a successful proof of concept. It facilitates capital mobilization in local currencies to ensure financial stability by reducing risk, aligning with responsible banking practices and empowering local borrowers to navigate their financial obligations with greater confidence.

[7] https://www.ebrd.com/home
[8] https://www.ebrd.com/what-we-do/products-and-services.html
[9] https://www.ebrd.com/documents/treasury/local-currency-financing-presentation-.pdf
[10] https://www.ebrd.com/news/2024/ebrd-commits-new-funding-and-support-for-ukraine-at-recovery-conference.html

Alexander McWhorter, Citi Ukraine's Citi Country Officer, commented on this milestone: "Since the war broke out, at Citi we've been working towards supporting Ukraine's community and economy. The collaboration with the EBRD is one more step towards providing more capital and financial solutions for stakeholders involved in Ukraine's reconstruction."

Case Study: IFC and Citi sign facility to increase access to local currency financing in Kenya

In July 2024, IFC and Citi announced a $65 million (Kenyan shillings equivalent) finance facility to expand IFC's ability to provide local currency financing in Kenya. IFC sought local currency to on-lend to clients on the ground to help expand Kenya's digital infrastructure.

"Currency volatility and debt distress has made access to local currency financing more important than ever," said John Gandolfo, IFC Vice President and Treasurer, Treasury & Mobilization. "By partnering with Citi, IFC can expand its ability to source local currency financing to provide local currency solutions for our clients and help shield them from currency fluctuations."

"We are pleased to partner with the IFC to develop innovative local currency solutions," said Julie Monaco, Global Head of Public Sector Banking at Citi. "This inaugural Citi facility with IFC in Kenya is a first-of-its-kind solution and has the strong potential for replication across our emerging market franchises. By working strategically with multilateral development banks and development finance institutions, Citi's local currency platform addresses currency mismatches and foreign exchange risk, especially prominent in Africa, which then accelerates financing for development projects."

IFC offers a wide array of local currency products to its clients, including loans, bond investments, cross-currency swaps, securitizations, guarantees, and risk-sharing facilities. Between July 2023 and June 2024, IFC committed $5.9 billion in local currency financing, which represents more than 30% of its long-term debt commitments. Over the last decade, IFC has committed over $30 billion in more than 70 local currencies.

New solutions moving forward: Private Sector Investment Lab (PSIL)

Given the widespread recognition that local currency funding is a proven effective tool to help borrowers meet financial obligations and better insulate them from external shocks, it is critical to find sources of local currency beyond swaps and derivatives if MDBs are to meet project needs and lower breakage costs. This is a key focus of the Private Sector Investment Lab (PSIL), an initiative launched in 2023 between the WBG and a core group of 15 CEOs and Chairs of leading private sector institutions.

The goal of the Lab is to develop solutions that promote private sector investment in emerging markets through approaches that can be implemented at scale. The Lab has already delivered a variety of recommendations, including on the use of guarantees, regulation, originate-to-distribute models, and more.[11]

The Lab is developing additional solutions to mitigate FX risk other than just through hedging. This includes solutions to increase local currency financing and facilitate private investment, especially to promote the transition to a greener economy.[12] For example, WBG is working in collaboration with PSIL on a solution called the Multi-Layer FX Risk Sharing Facility, which would allow FX risk to be spread across a variety of stakeholders, including the private sector, governments, and WBG.[13] Other solutions include unfunded products such as guarantees and risk sharing facilities in local currencies. These new and innovative solutions highlight some of the many ways local currency can be used to mitigate FX risk for borrowers.

Conclusion

Local currency funding is critical to mitigate risks for borrowers that result from hard currency lending by MDBs. Until now, shallow domestic markets have, in the majority of emerging market countries, hampered MDBs' ability to hedge local currency lending or borrow locally. The importance of resolving this challenge led to the establishment of the PSIL by the WBG and of leading private sector institutions with the goal of finding alternatives to both hedging and local currency bonds.

Citi's MDB Lending Solution leverages the bank's global network to realize these ambitions with an innovative tool that has already been successfully deployed. It provides a stable long-term source of local currency funding, helping to address the mismatch for MDB's clients and development projects, enabling MDBs to plan more effectively. As well as overcoming the FX risk associated with local currency lending, Citi's solution provides a valuable boost to broader efforts to develop emerging market and frontier countries' financial market capabilities, to the long-term benefit of their economic prosperity and resilience.

Citi would welcome the opportunity to explore how its MDB Lending Solution could benefit additional MDBs and DFIs and encourages interested readers to get in touch. ■

[11] https://www.worldbank.org/en/about/unit/brief/private-sector-investment-lab
[12] https://www.worldbank.org/en/about/unit/brief/private-sector-investment-lab
[13] https://www.iadb.org/document.cfm?id=EZIDB0000577-986313001-135

"Little else is requisite to carry a state to the highest degree of opulence... but peace, easy taxes, and a tolerable administration of justice."

– Adam Smith

Tax Revenue Mobilization, Public Finance Management *and Global Best Practices*

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Taxation is the mechanism through which governments extract financial contributions from individuals and enterprises. But it is also the foundation of a government's mandate and fundamental to the functioning of modern societies. It facilitates and funds the provision of essential public services such as healthcare, education and infrastructure, while simultaneously promoting greater economic growth and development.

Yet, it is far more than just a technical or economic issue; it is a subject with deep social and political significance that often provokes strong reactions from the public. Recent events provide examples of social unrest sparked by changes in tax policies or by authorities perceived to be managing revenues inefficiently or opaquely, as seen in Kenya.

To address the pressing challenges of revenue mobilization and tax collection, governments must adopt a multifaceted approach that considers the economic, social, and political ramifications of tax policies, practices, and public spending. In this article, we will outline the key factors that impact authorities' ability to mobilize financial resources and collect taxes: institutional capacity, compliance and enforcement measures, and innovations to adapt to market and societal changes such as climate change and digitalization. We will also identify and highlight best practices deployed by various countries that governments should consider adopting to enhance their revenue mobilization competencies.

Strengthening institutional capacity is fundamental for effective tax revenue collection. *Strong institutions foster transparency, simplify tax processes, and build public trust*, all of which are essential for improving compliance and increasing tax revenues.

Institutional capacity

Strengthening institutional capacity is fundamental for effective tax revenue collection. Strong institutions foster transparency, simplify tax processes, and build public trust, all of which are essential for improving compliance and increasing tax revenues.

Governments must cultivate systems where transparency and accountability are central pillars of revenue collection. Policy ideas include frequent publication of government budgets with detailed breakdowns of expenditure and revenues, governance frameworks for taxation authorities to ensure transparency, and the use of technology tools and procurement management to aid collection. In addition, reviewing government spending across departments, linking personal taxes directly to government programs for welfare and education, and engaging citizens through community oversight boards can enhance public trust and participation in taxation.

For instance, Rwanda has enjoyed a sustained increase in tax collection over the past 30 years due to its governance and anti-corruption reforms, including intensive collection efforts, thorough auditing procedures, and close scrutiny of large taxpayers. The Rwandan Revenue Authority has spearheaded these successes, while there have also been administrative reforms such as land records systems.

Simplifying filing procedures for both individuals and corporations can reduce the complexity of tax regulations. This can be achieved through legislation that promotes flat rates and limits exemptions. Tax collection systems should also be modernized to address advancements such as digital services. Digitizing tax forms and automatically populating repeat information can save time and encourage compliance.

Estonia is a good example of this, with high levels of public trust – 38% of Estonians report moderate to high trust in the national government.[1] This goodwill is partly due to the country's institutional regulations and the work of its National Audit Office, which monitors budget expenditures and fights disinformation. Estonia consistently ranks high on the Tax Foundation's tax competitiveness index.

By ensuring fair and consistent application of rules, governments can build public confidence. This includes having a detailed external review process to assess tax evasion by individuals and firms, and making all tax reforms and laws easily accessible and written in plain language.

In Georgia, after the 2003 Rose Revolution, the new administration launched tax reforms and anti-corruption initiatives. Tax and customs agencies were merged, a Revenue Service was established, and major tax infrastructure was upgraded. A revised tax code simplified the system, and by 2008, the tax revenue-to-GDP ratio had roughly doubled.[2] Most recently, in 2022, an Anti-Corruption Bureau was created to further anti-corruption policies and oversee political financial activities.

[1] https://www.oecd.org/en/publications/oecd-survey-on-drivers-of-trust-in-public-institutions-2024-results-country-notes_a8004759-en/estonia_767c2818-en.html
[2] https://www.imf.org/en/Publications/fandd/issues/2018/03/akitoby

Enforcement and compliance measures

Ensuring taxpayer compliance with tax regulations is a challenge in many countries, leading to various enforcement actions. If an efficient tax system is to be rooted in public trust, it is crucial for governments developing policies to focus on institutions with proven track records.

For instance, Estonia aims high with its policy objectives, striving to achieve one of the highest voluntary tax compliance rates in Europe. The Estonian Tax and Customs Board (ETCB) actively works toward this goal by forming agreements with various digital platforms, allowing platform workers to report their earnings to tax authorities with just a click. This user-friendly approach has led to 97% of tax returns being filed electronically, and an annual public survey by the ETCB shows that 91% of Estonians believe paying taxes is a civic duty.

Luxembourg serves as another successful example of enforcing tax compliance through the adoption of an Anti-Tax Avoidance Directive. This directive includes five anti-avoidance measures that took effect in early 2019, based on the Anti-Tax Avoidance Package proposed by the European Commission. One key measure is 'exit taxation,' which prevents companies from relocating their assets solely to avoid taxes.

Encouraging innovation

Building institutional capacity and enforcing tax compliance measures are both crucial for establishing a trustworthy tax system. However, in rapidly modernizing economies, it is also important for tax systems to reflect current trends and income flows.

For instance, green taxation measures address urgent concerns about climate change by allowing governments to combat rising global temperatures while generating fiscal revenues. These measures leverage taxation as a public policy tool to effectively influence behavior and consumption patterns.

In Spain, the introduction of an explicit Carbon Tax in 2014 meant that fluorinated greenhouse gases were directly taxed. The tax rates were set by weight (in kilograms) and followed the polluter pays principle, ensuring that rates were proportional to their global warming potential and could be adjusted through the Annual Budget Law.

Guyana also implemented an Environmental Tax, but as a levy on imported non-returnable containers. In 2017, this tax was raised, levied and collected at a rate of $10 per unit. The Guyana Revenue Authority believed this would encourage recycling and increase tax revenues.

Another example of how green taxes can influence public behavior is the plastic bag tax in England. In 2015, all supermarkets introduced a 5p charge for carrier bags, which was increased to 10p in 2021 and extended to all businesses. As a result, the use of single-use supermarket plastic bags at major retailers has decreased by over 97% since 2015.[3] The average person now buys about three single-use carrier bags a year from major supermarkets, compared to 140 in 2014.[4]

Similar to green policies, governments that think creatively can expand their tax base. It is beneficial for revenue authorities to explore ways to tax digital income streams and use technology to improve efficiency and tax revenue generation.

For instance, in India, the Goods and Services Tax E-Way Bill aims to reduce GST evasion by requiring digital documentation for goods transported within the country valued over Rs50,000 (approximately $600). This system allows for real-time validation of transactions, helping authorities identify discrepancies between E-Way bills and GST returns. Shortly after the system was introduced, tax officials reported a positive impact on tax collections.

[3] https://www.gov.uk/government/publications/carrier-bag-charge-summary-of-data-in-england/single-use-plastic-carrier-bags-charge-data-for-england-2021-to-2022
[4] https://www.gov.uk/government/publications/carrier-bag-charge-summary-of-data-in-england/single-use-plastic-carrier-bags-charge-data-for-england-2021-to-2022

Digitized systems also enable countries like Australia to implement policies such as the Single Touch Payroll (STP), a digital payroll reporting system introduced by the Australian Taxation Office in 2018. This system requires employers to report payroll information, including salaries, wages, and withholding, in real-time with each pay run. By providing more detailed reporting, STP data is designed to reduce compliance costs and save time for businesses with payroll tax obligations. This example demonstrates how digitized policies can enhance efficiency and improve tax collection rates for governments.

Overcoming challenges

There are various methods to improve the enforcement of measures aimed at increasing tax collection and the taxation base; however, all governments and their respective revenue authorities face challenges. It is not just developing countries that encounter these hurdles; efficient, streamlined, and fair tax systems require ongoing work, attention, and adaptation.

One significant challenge is mobilizing government revenue in cash-based economies. Such economies often struggle with tax collection because transactions occurring outside the formal economy represent potential lost revenue. This issue arises from several factors, including a lack of paper trails, an informal market structure, limited data and information, and reduced audit effectiveness.

Nevertheless, several countries with cash-based economies have successfully implemented policies to address this issue, featuring key replicable takeaways.

For example, in Germany, cash remains the most frequently used payment method, accounting for 51% of transactions in 2023. However, the tax-to-GDP ratio is notably high at 39.3% in 2022, reflecting the strength of its institutions and policies, such as extensive tax office coverage, the country's economic history, and cash-basis accounting for small and medium-sized enterprises (SMEs).[5] Additionally, Federal Tax and Audit Offices receive substantial training and support, with the Audit Office alone operating on an annual budget of €192 million.[6]

Germany relies heavily on tax audits to ensure taxpayer discipline, conducting unplanned audits for small businesses and regular audits for larger corporations. Moreover, due to previous periods of hyperinflation, cash is used in the absence of credit to suppress demand and reduce inflation. A strong social safety net discourages tax evasion by showing citizens the positive impact of tax dollars. Finally, by enabling cash-basis accounting for SMEs, small businesses with annual turnovers below €600,000 can simplify their accounting and tax return processes.

Similar to cash-based economies, developing markets often have sizable informal sectors that are not captured in the tax system. Governments must take a holistic approach to build systems that incentivize those working in shadow sectors to declare their income through formal channels, such as offering strong insurance and worker benefits. For example, Uruguay has seen a decrease in informal employment by reforming taxes and the social security system while increasing the benefits of formal employment. This underscores the importance of robust social systems and their connection to citizens' sense of obligation to pay taxes.

[5] https://www.oecd.org/content/dam/oecd/en/topics/policy-sub-issues/global-tax-revenues/revenue-statistics-germany.pdf
[6] https://www.bundesrechnungshof.de/EN/1_about_us/about_us_node.html

Another challenge involves collecting taxes on person-to-person digital payments, especially due to large transaction volumes, the difficulty of distinguishing between personal and business transfers, and evasion of reporting requirements. As digital platforms like Venmo and Zelle become more prevalent in the digital economy, ensuring proper taxation is crucial for maintaining a fair tax system. Several countries, including Brazil, have made significant strides in leveraging digital platforms.

The Central Bank of Brazil launched an instant payment system, Pix, in November 2020 to facilitate real-time money transfers between people and businesses. Since its launch, Pix has been widely adopted, with about 80% of Brazil's adult population and 13 million firms using the system as of May 2023.[7] Approximately 71.5 million new users reported that they had not made electronic credit transfers prior to Pix's introduction.[8] As of 2023, Pix processed over 3 billion transactions monthly, enhancing transaction transparency, reducing cash transactions, and lowering transaction costs.[9]

Governments must also find new ways to tax evolving digital sectors where e-commerce operations transcend borders, making it challenging to quantify and enforce taxation measures. These digital sectors must not be overlooked if the integrity and equity of tax systems is to be upheld. For instance, Nigeria enacted a Digital Services Tax (DST) through the 2021 Finance Act, mandating digital companies with a significant economic presence in the country to remit a portion of their annual domestically generated turnover from digital activities as corporate income tax. This strategy aims to increase the tax base by requiring large digital service providers to participate in the Nigerian tax system, even if they do not have a physical branch or office. This approach is increasingly relevant with the rise of multinational digital companies operating across multiple geographies.

Conclusion

The opportunity for governments across the world to optimize and strengthen their tax systems is extensive; the need to do so is urgent. Fiscal deficits have ballooned due to the increasing scope and scale of public expenditures driven by infrastructure gaps, health crises, climate change and demographic shifts. While the uses of public funds are multiplying, the sources of financial resources are static or dwindling. Governments must work to enhance their institutional capacity, improve the effectiveness of their compliance and enforcement measures, and continue to innovate.

The private sector also has a role to play, not only in fully complying with taxation rules and regulations, but also in making available its technology, data and connectivity to improve access to a dynamic tax base.

Citi is actively engaged in finding ways to support revenue authorities through both advisory and the provision of treasury solutions necessary for building optimal systems. The bank is committed to collaborating with public sector clients to help them leverage the immense power of digital and streamlined solutions to enhance transparency and strengthen their resource mobilization capabilities. ■

[7] https://www.elibrary.imf.org/view/journals/002/2023/289/article-A004-en.xml
[8] https://www.elibrary.imf.org/view/journals/002/2023/289/article-A004-en.xml
[9] https://www.elibrary.imf.org/view/journals/002/2023/289/article-A004-en.xml

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The advantages of adopting digital money have been well-articulated and widely known for years, but only as of recent, technological innovation, regulatory initiatives, and shifts in consumer behavior are accelerating preparedness for digital money.

The Digital Economy and *the Key Role of Government Support*

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A shift towards the digital economy

The digital economy is no longer a futuristic concept. Driven by rapid technological advancements, the expansion of the internet, the high increase of smartphone penetration and the digitalization of almost every aspect of society, the resulting hyperconnectivity is transforming the way people, businesses, and institutions engage with each other and conduct transactions.

One of the most significant aspects of this change is that the world is witnessing a profound shift towards digital interactions, digital payments, and more broadly, to a digital economy. This transition is not just a convenience, it is a foundational element of the broader digital transformation that is shaping modern economies and societies.

The advantages of adopting digital money have been well-articulated and widely known for years, but only as of recent, technological innovation, regulatory initiatives, and shifts in consumer behavior are accelerating preparedness for digital money.

In Latin America, this shift holds particular significance. The region, with its diverse economies and varying levels of financial inclusion, stands to benefit immensely from embracing digital payments and moving away from reliance on cash. Digital Money offers tangible advantages and benefits for all. It can streamline government operations, increase tax revenue collection, bring greater transparency, and reduce costs while enhancing institutional efficiency and financial inclusion. For citizens it can offers greater fluidity, convenience and security when acquiring goods and services. Most importantly it offers greater visibility to gain access to services of different nature, promoting financial inclusion for the unbanked and underbanked populations, who have been traditionally excluded from the formal economy. Businesses may benefit from a more efficient collection method and new people accessing the formal economy.

Certainly, the journey to drive digital money readiness and adoption has been challenging. The Latin America Digital money index report, published by Citi and Imperial College Business School (2274514_LATAM_Digital_Money_Report.pdf (citibank.com), identified 5 key pillars that are supporting Latin America countries to move towards Digital money, as a cashless society:

- **Pillar 1:** Government and market support
- **Pillar 2:** Information and communication technology (ICT) infrastructure:
- **Pillar 3:** Financial Market Infrastructure modernization
- **Pillar 4:** Digital money solutions
- **Pillar 5:** Propensity to adopt.

In this article we delve deeply into the 1st pillar: **Government support to Digital Money readiness**.

By embracing digital money, the countries in the region can unlock new economic opportunities, foster innovation, and ensure that their economies are better equipped to compete in *an increasingly digital global marketplace.*

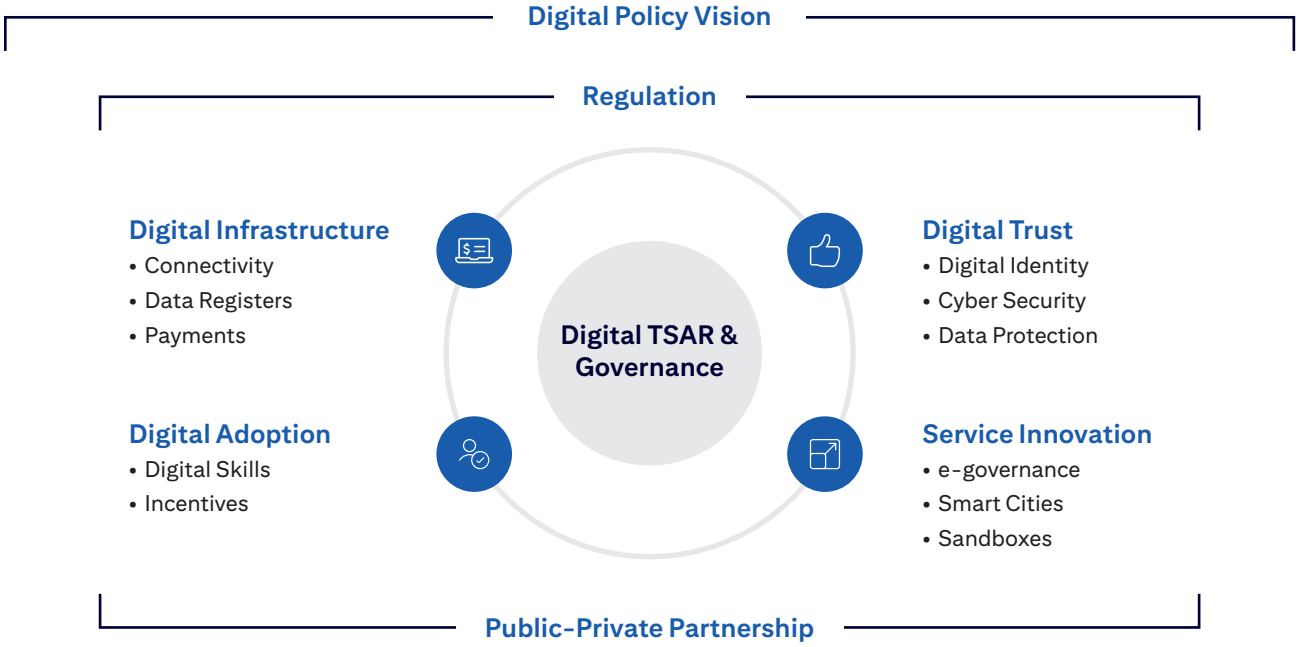
The pivotal role of government public entities in advancing Latin America digital economy

By embracing digital money, the countries in the region can unlock new economic opportunities, foster innovation, and ensure that their economies are better equipped to compete in an increasingly digital global marketplace.

As Latin America transitions toward a fully digital economy, as a cash less society, the role of government entities is critical in creating the ***foundation*** and setting the ***pace*** for a thriving, inclusive and secure digital ecosystem. Their role is crucial for enabling and maintaining the **Digital Public Infrastructures** required to foster economic growth, enhance financial inclusion and improve efficiency and interoperability of digital payments.

When considering what to do – and what not to do – and to maximize digital money readiness, it is important to recognize that every country has different circumstances, needs, and levels of financial services maturity. There is no one-size-fits-all model. Nevertheless, there are some broad aspects of successful digital money readiness that should be prioritized by countries. The following are key aspects to cover:

1. **Holistic digital policy:** policymakers that play an active role beyond enacting policies and articulating coordination and synergies have made more progress in driving digital money adoption. Governments must establish a digital vision that aligns with their larger goals, such as promoting growth, improving service delivery, and financial inclusion, among others.



2. **Strong governance, support, and coordination** is fundamental to focus on meeting defined goals, find synergies, and speed time to market. This orchestration should extend not only across government entities, policies, and regulations, but also to strategies related to ICT (Information and Communication technology) infrastructure, financial services, and digital inclusion.

   After approving the vision, it is important to establish initiatives and rules to put things in motion, and (eventually) establishing a solid governance, oversight structure, and a Digital Tsar or Digital Transformation Owner to ensure coordination and synergies among entities.

   It is also relevant to identify areas of focus where public sector intervention and investment are most needed, to facilitate the development of targeted policies and initiatives.

3. **Facilitating collaboration and adoption:**

   Public-private collaboration is crucial. It is necessary ensuring equitable representation of all stakeholders as government, institutions, new players and organizations representing individuals and businesses. This holistic approach ensures that digital money initiatives deliver benefits to all and set the foundation for a clearly articulated execution and communication of digital money benefits and new dynamics.

   Regional collaboration and knowledge sharing are equally essential for accelerating the region's collective progress towards a thriving interconnected digital economy. Leveraging multilaterals organizations, which are supporting Latin America development via several programs, can also bring significant advantages in terms of defining standards and progress.

Effective collaboration results in maximizing efficiencies and streamlined technical integrations, as isolated implementations are extremely costly. For example, a single, centralized integration point reduces complexity and costs, and speeds time to market, which can be passed on to consumers, driving broader adoption.

Digital literacy is also a fundamental component. *Governments must ensure that citizens have the skills to effectively use digital tools and services.*

4. **Government policies and regulations: Privacy, Consumer Protection, and Cybersecurity**

As infrastructure is built, it is important to establish consumer, businesses and entities trust to bring them on board and raise their level of comfort with new digital money dynamics. Governments must establish and enforce regulations that protect individuals and businesses from digital fraud, data breaches, and cyberattacks.

Developing comprehensive regulatory frameworks that address Privacy, Consumer Protection, and Cybersecurity regulatory frameworks are crucial to protect the rights and security, to promote best practices and solutions, and to build trust.

In Latin America, countries like Brazil, Chile, Colombia, Mexico, and Uruguay have enacted laws and made significant progress in these areas. Brazil's General Data Protection Law sets strict guidelines on the collection, processing, and storage of personal data, empowering citizens with more control over their information. Similarly, Mexico's Federal Law on the Protection of Personal Data held by Private Parties provides comprehensive rules for protecting personal data.

Governments are also creating cybersecurity frameworks that require businesses and institutions to adopt protective measures, strengthen cybersecurity protocols and report breaches. Special resources are also dedicated to improving digital defenses, and governments across the region are strengthening cybersecurity strategies, creating specialized agencies, reinforcing critical infrastructure protection, and fostering collaboration between the public and private sectors to combat cyber threats. Some countries are emphasizing the importance of building a culture of security across institutions and citizens.

5. **Government strategy around broadband and Wi-Fi expansion**

Accessible and reliable broadband and Wi-Fi access are the backbone of the digital economy, and governments in Latin America are making significant strides to improve connectivity. Expanding access to affordable, high-speed internet is essential for digital inclusion, economic growth, and competitiveness in the global economy.

Countries like Argentina, Brazil, Chile, Colombia, Costa Rica, and Mexico are investing heavily in expanding fiber-optic networks to reach remote areas, while Brazil's National Broadband Plan seeks to deliver broadband services to underserved regions, promoting digital inclusion, and making internet access ubiquitous. These initiatives are supported by public-private cooperation, private investments as well as regional cooperation, ensuring that broadband expansion remains a top priority.

Governments are also promoting public Wi-Fi access in urban and rural areas, providing free or low-cost connectivity to schools, public spaces, and transportation hubs. For instance, Colombia's *Zonas Wi-Fi Gratis para la Gente* initiative has installed thousands of free Wi-Fi zones across the country, significantly increasing internet access in public spaces.

6. **Strategies for digital inclusion and digital literacy**

Digital inclusion is the core of an equitable digital economy. Governments are tasked with ensuring that everyone—regardless of socioeconomic status, geographic location, or educational background—has access to the infrastructure that supports the digital economy, such as telecommunications, banking, and payments, as well as shared IT platforms. In Latin America, countries are implementing targeted policies and programs to close the digital divide.

Digital literacy is also a fundamental component. Governments must ensure that citizens have the skills to effectively use digital tools and services. This includes teaching the basics of internet use, promoting digital citizenship, and providing training in advanced digital skills such as coding and data analytics.

For example, in Argentina there are programs to provide laptops and digital education tools to students. Colombia's Ministry of Information and Communication Technologies (MinTIC) has campaigns focused on educating citizens about best practices for navigating the internet securely, while Chile has programs of digital alphabetization aimed to improve digital literacy. These programs are crucial for equipping citizens with the skills needed to participate fully and securely in the digital economy.

7. **E-Government: Public online services, leading by example:**

E-government initiatives, including digital transactions, are transforming how citizens interact with public services, making them more accessible, efficient, and transparent. Governments across Latin America are digitizing services, from tax filing and social security to healthcare and education, enabling citizens to access services from anywhere at any time. A few countries are advancing in national ID systems, which enable secure online identification for accessing government services.

Uruguay, Chile, Argentina, Brazil, Costa Rica and Peru, are countries leading EGDI, *E- Government Development Index*, with good examples of digital simplified and centralized access to public services with portals where citizens can access hundreds of online government services.

8. **Financial Market Infrastructure (FMI) modernization agenda:**

Latin America's FMIs are changing dramatically. The transition to digital money is a cornerstone of the digital economy, and governments and Central Banks are playing an active role. We can find several Central Banks in the region developing a clear modernization agenda around:

- **Instant payments schemes and interoperability.** These are the top priorities to facilitate cashless transactions, promote formal commerce and increase financial inclusion. Brazil with PIX, launched by the Central Bank of Brazil, has been an instant payments global referent, enabling millions of people to conduct real-time digital transactions with ease use and to support multiple use cases. Other countries have advanced also in enabling instant payments schemes, improving efficiency of payments across the economy as Argentina, Chile, El Salvador, Mexico, Paraguay, and Peru.
- **Open banking/Open finance/Open data:** These foster data and payments interoperability, efficiency, and competition by enabling third-party providers, such as *Account information payments providers (AISPs) and Payment initiator service providers (PISPs)*, to access customer data and to initiate payments, with the explicit consent of the individual/business account owner. Brazil leads the region, having successfully deployed 4 stages, while Mexico has deployed its first stage 1. Chile and Colombia are making progress with regulatory frameworks and have started implementing, while other Latin American countries are under proof-of-concept phase.
- **Central Bank digital currencies (CBDCs).** Governments are also exploring the potential and impact of Central bank digital currency, to help modernize financial systems. Bahamas was the first country in the world issuing a CBDC, the SandDollar in 2020, followed by Jamaica issuing Jam-Dex in 2022, and Brazil is piloting DREX. On the other hand, El Salvador was the first country in the world to adopt Bitcoin as legal tender currency, deploying a government e-wallet named Chivo. While the impact and success of these initiatives are in different stages, the evolved and forward-looking thinking of the Central Banks is a proof of the governments desire to work on Digital Money programs.

Lastly, there is a big contribution in this transformation from the financial sandboxes—regulatory environments that allow financial institutions and new players to test innovative financial products under government supervision— which are available in countries like Brazil, Colombia, Mexico, and Peru. These sandboxes promote innovation while ensuring that consumer protection and financial stability are maintained. Financial Innovation Hubs, available in Argentina, Bahamas, Brazil, Colombia, Costa Rica, Dominican Republic, El Salvador, and Guatemala, are also contributing to these innovation efforts.

By promoting this FMI evolution, governments are not only modernizing financial infrastructures but also providing citizens with more secure and efficient ways to conduct transactions, thereby reducing reliance on cash, and fostering a more inclusive financial ecosystem to harness the opportunity of the digital economy.

Conclusion

Latin America is brimming with potential when it comes to digital money adoption, fueled by a collaborative spirit. The role of government in advancing Latin America's digital economy is multifaceted and pivotal. From building robust regulatory frameworks to promoting digital inclusion, cybersecurity, and financial innovation, government entities are laying the foundation for a future that is not only digitally integrated but also equitable and secure. Despite these advances, significant challenges remain so there is still a long journey ahead to advance in digital money readiness.

Through proactive policies and strategic investments, and the right necessary incentives to support a cashless and digitally integrated economy, governments can harness the transformative power of the digital economy to drive economic growth and improve the quality of life for all citizens. ■

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SOEs are better equipped than private firms to withstand financial and regulatory uncertainty and absorb costs as they expand internationally.

Going Global: *Best Practices for State-Owned Enterprises*

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State-owned enterprises (SOEs) have reemerged as key players in strategic sectors since the turn of the century. Their assets were estimated to be worth around $45 trillion, equivalent to 50% of global GDP.[1] Where once most SOEs were purely domestic in nature, many now play a crucial role in advancing national interests while expanding globally. Their international ambitions, particularly in sectors like energy, often align with national strategies such as energy security.

SOEs are better equipped than private firms to withstand financial and regulatory uncertainty and absorb costs as they expand internationally. However, global operations add complexity: careful management of key treasury and financial practices relating to treasury management, cash forecasting, regulations and compliance, and the challenges posed by a changing global payments landscape is essential.

Key challenges associated with internationalization

- **Inefficient Payment Processes:** Global expansion, especially where it results from M&A activity, can leave organizations with multiple payment systems and processes. For many SOEs, rapid growth in trading with subsidiaries has led to disparate, inefficient inter-company transaction processes.
- **Limited Bank Account Visibility:** Maintaining an accurate, up-to-date view of all bank accounts across subsidiaries is challenging and time-consuming, particularly when multiple banks are involved. Treasury staff often spend significant time managing accounts rather than focusing on strategic treasury tasks.
- **Imbalances in Group Working Capital:** Decentralized cash is a common challenge for SOEs. While some subsidiaries may hold cash in local bank accounts, others negotiate loans with various local banks. This leaves the group treasurer – responsible for global cash management –caught in the middle, trying to optimize working capital for the entire organization. Decentralized cash management can lead to unnecessary banking fees, and foreign exchange transactions conducted locally can be more costly than those handled centrally by the treasury.

[1] https://www.imf.org/en/Blogs/Articles/2020/05/07/blog-state-owned-enterprises-in-the-time-of-covid-19

- **Cash Forecasting Challenges:** Despite efforts to centralize financial processes, SOE group treasuries often struggle with cash forecasting at group level. This limitation puts extra pressure on treasurers and cash managers to maintain a clear picture of cash flows and working capital across the organization.
- **Exchange Rate Volatility and Geopolitical Uncertainty:** Sudden exchange rate shifts can impact profitability and complicate forecasting. Additionally, geopolitical and logistical disruptions to supply chains are becoming more common, adding further uncertainty.
- **Trapped Cash:** Unlocking trapped cash has become increasingly important for SOEs operating in countries with complex geopolitical and economic environments, especially in emerging markets. Regulatory restrictions on fund repatriation and foreign currency exchange are key contributors to trapped cash accumulation.

Overcoming challenges with effective solutions

There are several specific solutions that can help to address the challenges described above, including:

- **Enhanced Risk Management:** To mitigate the impact of sudden exchange rate fluctuations, companies can implement hedging strategies, manage currency exposure effectively, and use tools like forward contracts to stabilize cash flows.
- **Cash Pooling:** By consolidating cash from multiple subsidiaries into a central account, companies can optimize liquidity, ensuring funds are available where they are needed most.
- **Supply Chain Management:** Global disruptions can hinder order fulfillment. Solutions such as supply chain financing and inventory financing can improve resilience, reduce disruptions, and support stable cash flows.
- **Streamlining Payment Processes:** Delays in receiving international payments can disrupt cash flow. They are often caused by the use of multiple banking systems and complications that result from local regulations. To address this, SOEs can adopt payor identification solutions, funds tracking tools, and digital methods to expedite and streamline receivables collection.
- **Unlocking Trapped Cash:** Beyond standard repatriation methods like dividends, shareholder loans, and royalties, several strategies can reduce trapped cash and improve liquidity. These include setting up netting, procurement, or re-invoicing centers to bridge unrestricted and restricted markets.

A centralized treasury provides a *single, consolidated view of cash flows*, allowing the SOE to manage liquidity on a global scale and *apply consistent risk management practices.*

Effective implementation of these strategies requires the establishment of centralized treasury units and hiring professionals with expertise in global cash management, risk management, and foreign exchange. Familiarity with local banking landscapes and regulatory frameworks is also essential.

Centralized treasury functions enhance control and efficiency, particularly in cash pooling, currency risk management, and liquidity optimization. A centralized treasury provides a single, consolidated view of cash flows, allowing the SOE to manage liquidity on a global scale and apply consistent risk management practices. Centralization also streamlines cash forecasting, strengthens governance over funds, and reduces the risk of fraud and errors.

Choosing the right banking partner

Given the complexities of managing cash globally, it is essential for SOEs to work with banking providers that have a strong international presence. While global reach is crucial, advanced technology is equally important. SOEs should prioritize banks that have a robust cash movement system powered by application programming interfaces, providing a more intuitive, flexible, and data-rich experience.

These features streamline the payments process, making it easier for treasurers to digitize and improve transaction management. Centralized and standardized systems also give treasurers greater control over key processes.

Additionally, it is vital for the banking provider to offer access to an extensive global liquidity network and 24/7 payment rails. This reduces transaction costs for SOEs and eliminates traditional FX fees, such as lifting and beneficiary bank fees.

Operating across diverse regulatory environments can be resource-intensive. SOEs can benefit from consulting treasury advisors and treasury & trade solution sales teams at their banks for insights on best practices, local regulations, and solutions tailored to each market.

Conclusion

For SOEs expanding internationally, optimizing treasury structures, ensuring precise cash forecasting, and navigating local regulations are vital to success. While a centralized treasury enhances efficiency, maintaining local autonomy is essential for addressing region-specific risks. By implementing best practices in treasury management and staying up to date with global payment developments, SOEs can manage their financial operations effectively and support their strategic goals. ■

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