September 2016

# Closing the Gap

## Applying financial solutions and technological innovation to achieve the Sustainable Development Goals (SDGs)

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# Today's Seminar: Achieving the SUSTAINABLE DEVELOPMENT GOALS

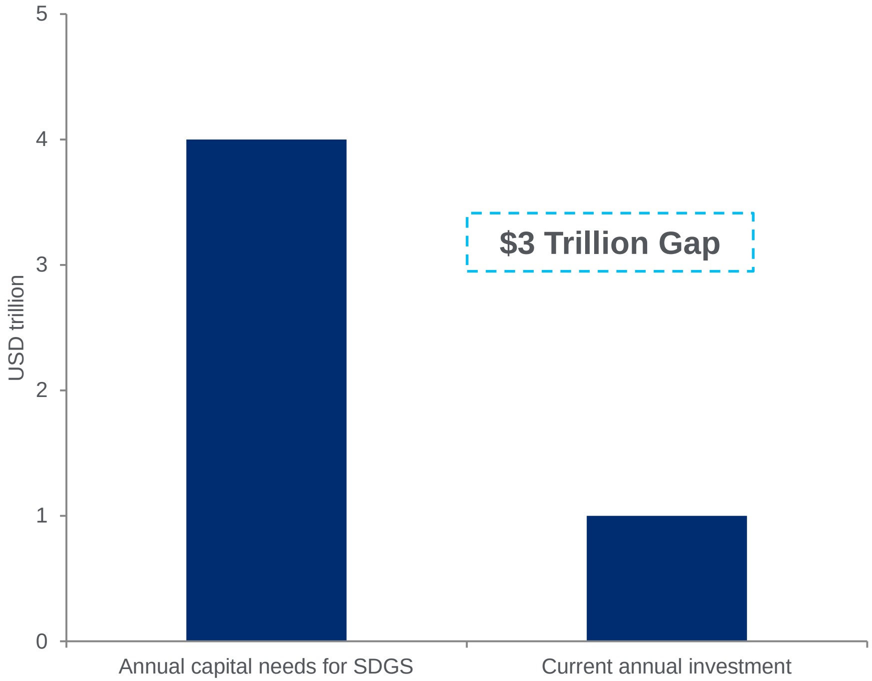
- The Sustainable Development Goals include 17 broad based objectives and 169 specific targets
- The estimated annual cost to achieve these goals is $3.5-5 trillion, while only about $1.5 trillion has been allocated, leaving a **$2-3.5 trillion funding gap**
- The goals will require a paradigm shift toward doing good and doing well at the same time
- Financially, there will a requirement for an entirely new age of private public partnerships and a crowding in of the private sector
- The capital markets will be one of the drivers of SDGs' funding success, and could become the single most meaningful component of the "billions to trillions" funding gap
- We will need to be creative in structuring funding solutions that achieve private sector return thresholds and can be applied across the SDGs, from the environment to infrastructure
- With $3.5 trillion lost a year in global GDP due to corruption, using technology as an integrity tool will be a powerful arrow in the SDG quiver


Source: Citi, World Economic Forum

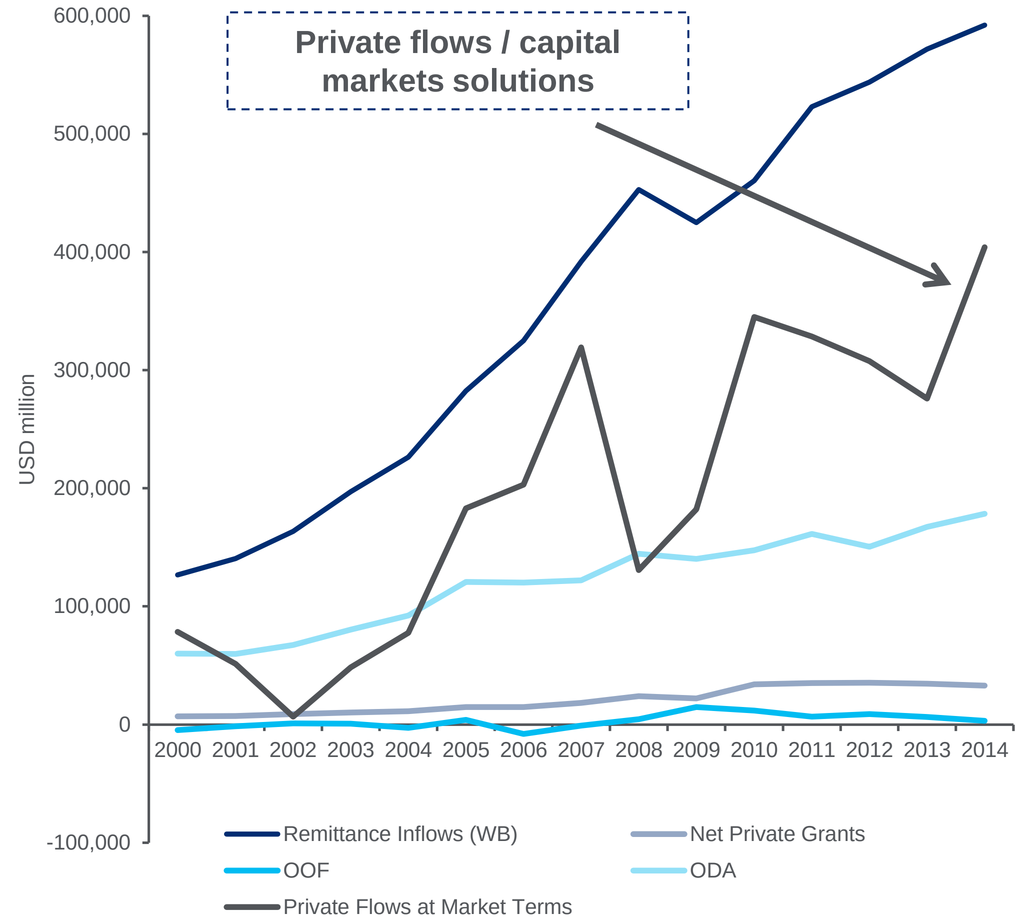
# 1. Financing the Sustainable Development Goals

# Financing the Sustainable Development Goals' Gap

## A significant financing gap exists for the SDGs…




## ...private flows on market terms and capital markets will be critical

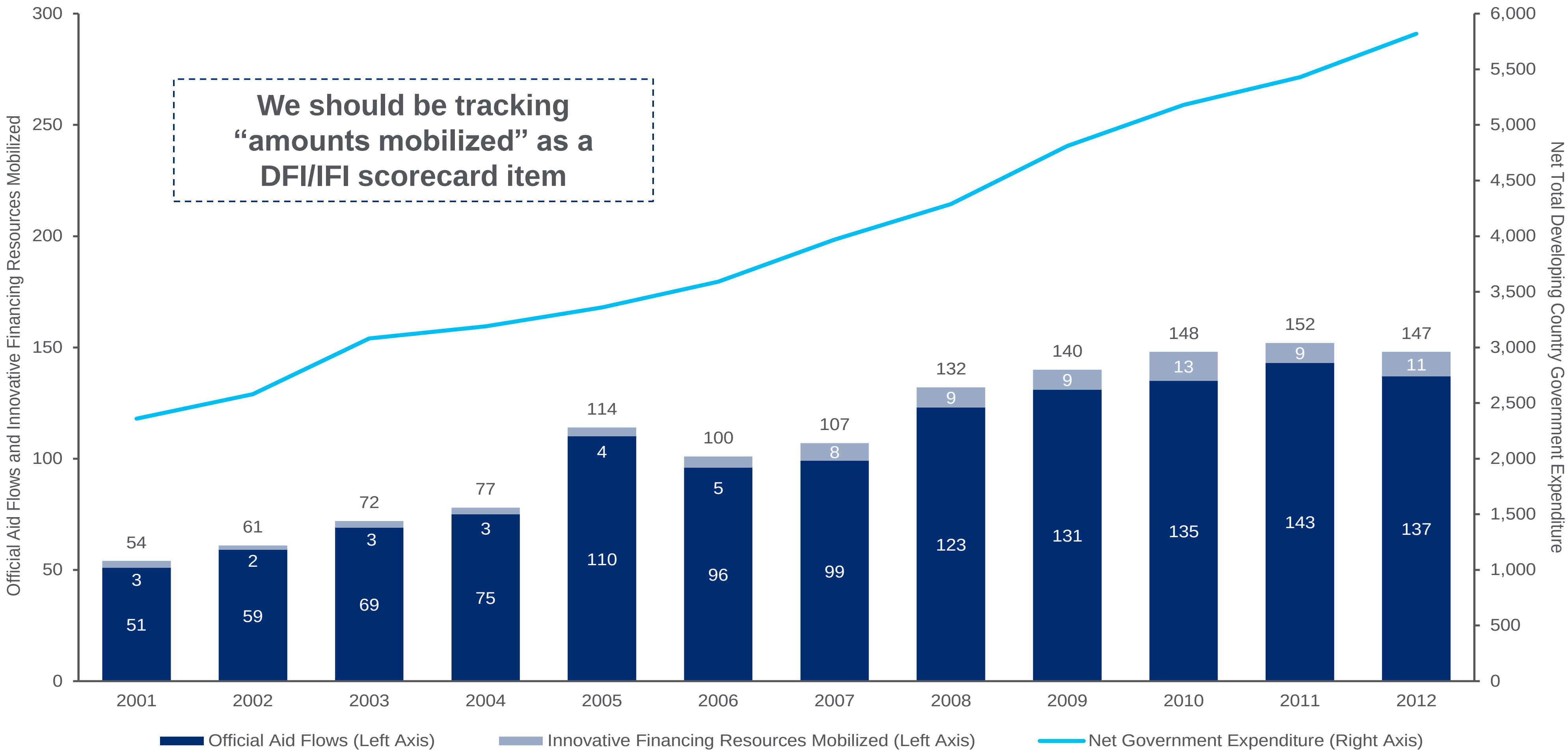



Source: OECD, World Bank

Note: OOF (Other Official Flows) are official sector transactions which do not meet the ODA criteria, e.g.: i.) Grants to developing countries for representational or essentially commercial purposes; ii.) Official bilateral transactions intended to promote development but having a grant element of less than 25 per cent; iii.) Official bilateral transactions, whatever their grant element, that are primarily export-facilitating in purpose. This category category includes by definition export credits. This category includes by definition export credits extended directly to an aid recipient by an official agency or institution ("official direct export credits"); iv.) The net acquisition by governments and central monetary institutions of securities issued by multilateral development banks at market terms; v.) Subsidies (grants) to the private sector to soften its credits to developing countries vi.) Funds in support of private investment

# Innovative Financing is Still a Small Component of Public Assistance

**Evolution of Funding for Public Goods in Developing Countries, 2001–2012**
$ in Billions

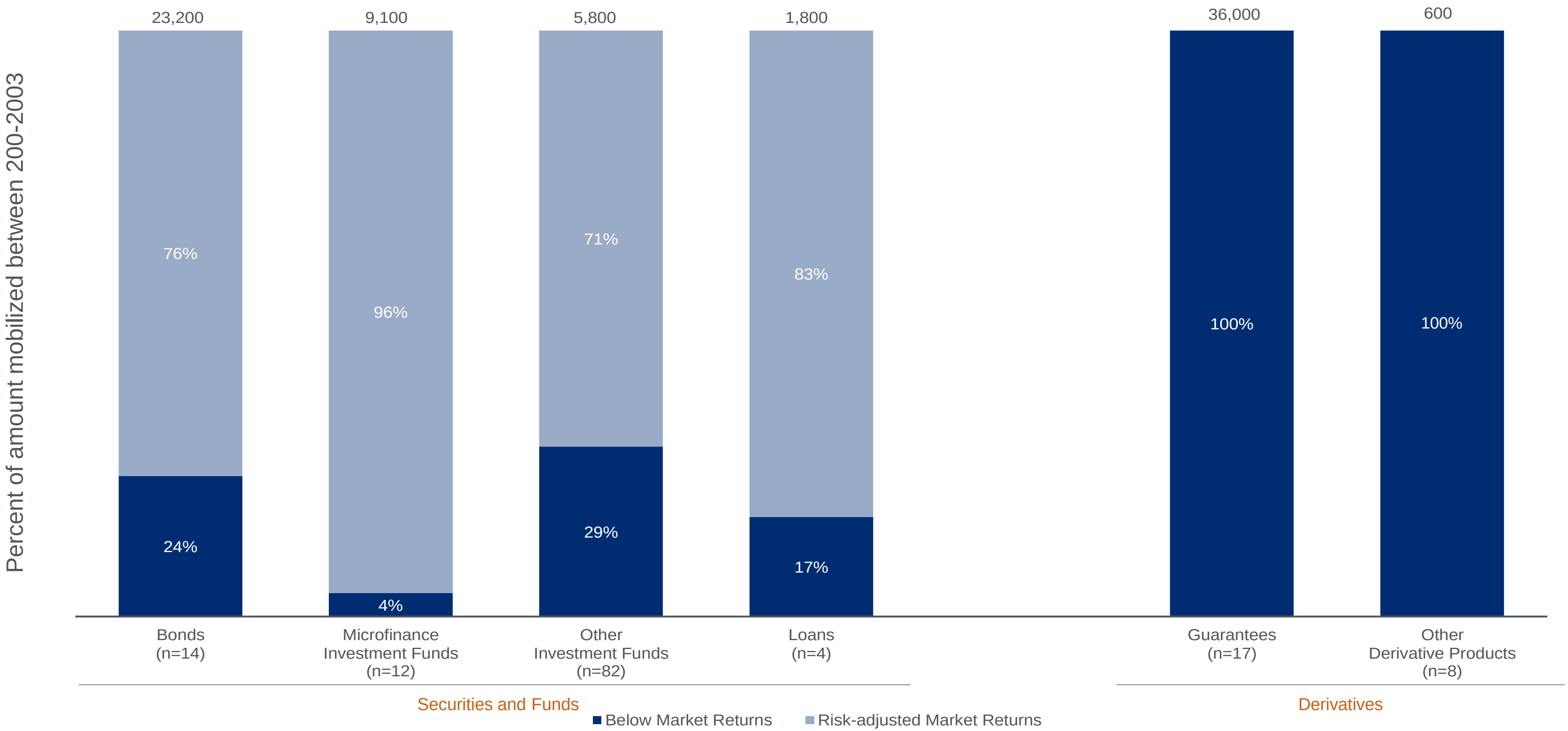



Source: Development initiatives, "Investments to End Poverty," 2013; OECD DAC Table 1; Innovative Financing Initiative Database; Dalberg analysis.

Note: Net Government expenditure includes government current expenditure for goods and services but does not include general budget support and loan disbursement to public sector; Official aid flows include Official Development Assistance and Others Official Flows; Innovative finance data is based on 278 innovative finance initiatives where volume data broken down by year was available. It assumes that innovative financing is additional to official aid.

# The Majority of Instruments Target Risk-adjusted Market Returns

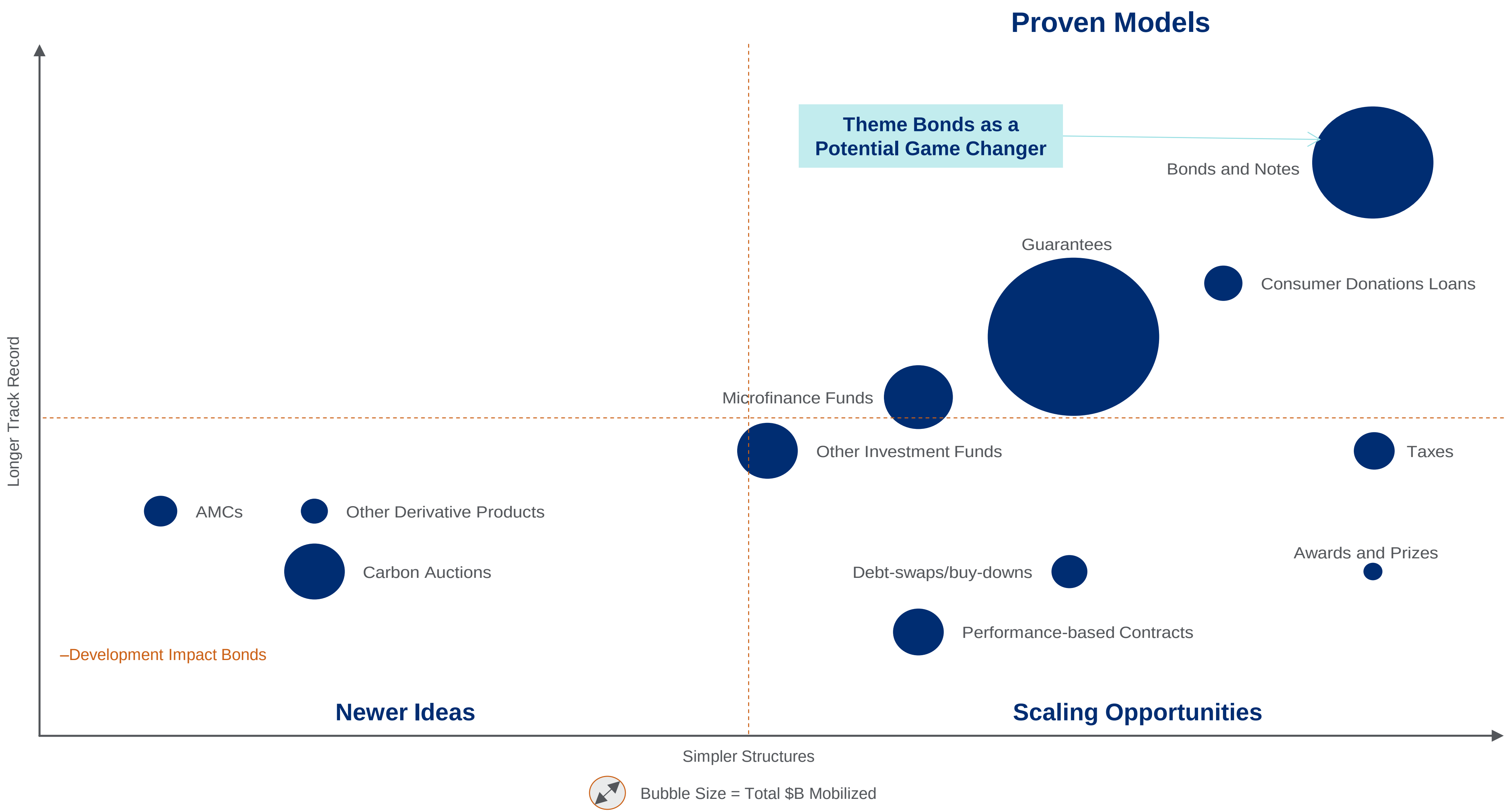
**Target Financial Performance for Securities, Funds and Derivatives, 2000–2013**
$ in Millions (n=225)




Source: Innovative Financing Initiative Database; Dalberg analysis.

Data included is a conservative estimate that only included transfers between countries, generic fundraising or remittances. Instruments were included if they mobilized resources for a developing country, produce a new instrument or attracted new participants to the market, or intended to produce positive social outcomes

# Financing Development - Landscape of Innovative Financing Mechanisms




Source: Innovative Financing Initiative Database; Dalberg analysis.

Note: No known Development Impact Bonds have been successfully issued to date although many are under development.

An AMC is an advance market commitment, a buyer (gvt or org), agrees to a pre-determined price with a service provider to increase production (e.g. under the Pneumococcal AMC, donors pledged $1.5bn to fund the subsidized purchase of 2bn doses of pneumococcal conjugate vaccine in 2009 and in exchange for the subsidy, manufacturers agreed to sell the vaccines to low-income countries for less than $3.50 for 10 years)

# 2. Theme Bonds

# Theme Bonds Have Tremendous Potential to Drive SDG Large Scale Funding Efforts

| Issuer | Theme Bonds |
|---|---|
| ADB | - **Water Bonds:** The ADB, through its Water Operational Plan 2011-2020, has committed to increase the coverage of sanitation, hygiene and wastewater management in Asia and the Pacific. In 2013, ADB approved $2 billion in projects related to water and sanitation, irrigation and drainage and river basin management. Since inception in 2010, ADB has raised over $1 billion in water bonds<br>- **Clean Energy Bonds:** In 2013, the ADB invested $2.3 billion in clean energy, continuing a remarkable level of investment in the sector. In 2008, ADB set a target to reach $2 billion annually in clean energy investments by 2013, and this target was met 2 years ahead of schedule in 2011. |
| IFC | - **Banking on Women:** IFC's Banking on Women strategy focuses on regions and countries that have strong, enabling ecosystems for SMEs, coupled with large numbers of women entrepreneurs. Since the launch of the Banking on Women program in late 2010, IFC has more than 20 investments and advisory services projects, with a portfolio of nearly $700 million to women-owned SMEs in Eastern Europe, East Asia and Africa and Latin America.<br>- **Inclusive Business:** Inclusive business models are commercially viable and replicable business models that include low-income consumers, retailers, suppliers, or distributors in core operations. IFC is at the forefront of a growing inclusive business movement. Since 2015, IFC has committed more than $9.5 billion and worked with over 400 inclusive businesses in more than 85 countries to integrate more than 200 million people. |
| IDB | - **"EYE" Bond Program:** The Education, Youth, and Employment (EYE) Bond program provides funding for IADB's eligible EYE project loan. IADB has a "life cycle" approach to building human capital from early childhood care and education, through formal primary and secondary education, as well as programs that facilitate labor market placement by improving the transition from school to work through vocational training. In this way, the IADB assists LAC countries to increase productivity and improve social inclusion of young people throughout key intervention stages. |
| BNG BANK | - **Sustainability Bond:** The BNG Sustainability Bond enables SRI investors to invest in sustainable Dutch cities via BNG with BNG risk and liquidity. As Dutch municipalities agreed in 2013 to be climate neutral before 2050 (SER Energy Agreement)m BNG supports the local governments to set and achieve their sustainability targets. |
| CITIZENS PROPERTY INSURANCE CORPORATION | - **CAT Bond:** Everglades Re Ltd, a special purpose insurer, issued a $1.5bn cat bond, a risk linked security designed to transfer a specified set of catastrophic risk from a sponsor to qualified investors. The issuance was on behalf of Citizens Property Insurance Corporation, a property insurance provider in Florida to owners that cannot get private insurance. The Citizens bonds' collateralize three years of reinsurance coverage and provide claims paying capacity for losses related to Florida hurricane events. For investors, this provides an alternative to traditional investments. |
| aetna | - **Pandemic Bond:** The $200mm Aetna reinsurance two tranche bond gives Aetna flexibility of capital use and reinsurance coverage against severe increases in health insurance claims. Pricing is at historic lows and investors have an opportunity to diversify their portfolio by gaining exposure to this new peril. |



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# Socially Responsible Investments ("SRI") / Green Bond Offerings

SRI/Green Bond offerings are increasingly becoming an established asset class in global bond markets, providing issuers with the opportunity to communicate socially responsible strategies, dedicate proceeds to specific initiatives and capture demand from the rising number of SRI funds.

## SRI Bonds

- *SRI Bonds are financial instruments used to raise funds dedicated to specific Socially Responsible Investments*

### Issuing Format

- *Documentation in line with plain-vanilla bonds*
- *Existing documentation, such as EMTN programme platform, can be used*

### Use of Proceeds & Traceability

- *Eligible socially responsible investments are selected*
- *Net proceeds of the bond are ear-marked for investments that meet the criteria defined above*

### Targeted Investors

- *Transaction marketed to the traditional institutional investor community as well as SRI specific investors, which will receive special focus during the allocation process*

### Pricing

- *Pricing is usually in line with a vanilla transaction*
- *SRI Bonds can enhance the issuer's distribution into new funds and new investors and sometimes perform better in the secondary market*

### 2nd Party Opinion

- *Extra-financial rating agencies can assist in building a Project Selection Framework, assessing the sustainability of existing potentially eligible projects and support the on-going reporting process*
  - *Examples: DNV, Cicero, Vigeo*

### Reporting

- *Issuers report at least annually on the specific investments made from the SRI proceeds*

***Green Bonds** are a subset of SRI bonds; while SRI bonds are tied broadly to "socially responsible" investments, the proceeds for Green Bonds exclusively target climate and / or environmental sustainability purposes*

# The Green Bond Principles

The Green Bond Principles are voluntary process guidelines that recommend transparency and disclosure and promote integrity in the development of the Green Bond market by clarifying the approach for issuance of a Green Bond. The key suggested guidelines for the issuance of these securities are outlined below.

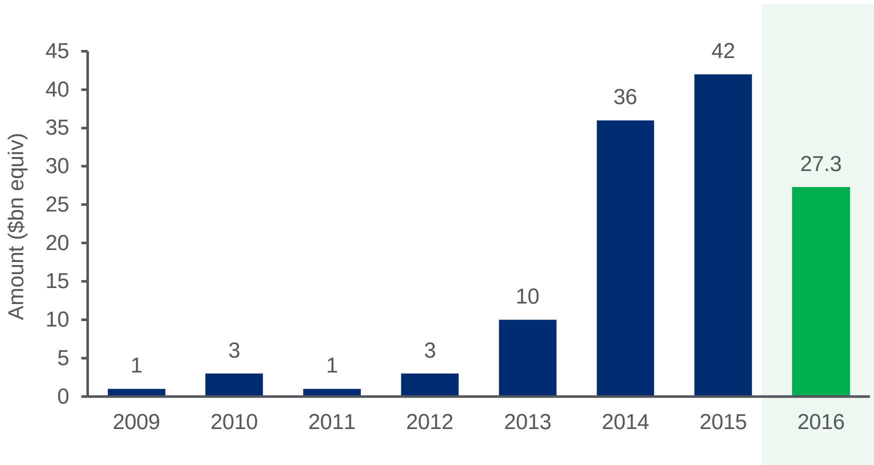
- A governance document sets forth the rules for GBP administration and establishes a GBP Executive Committee, which has the authority to address matters related to the GBP and issues the annual GBP update
- The Executive Committee is composed of 8 investors, 8 issuers and 8 underwriters
- citi is a co-founder of the Green Bond Principles, which have four components:

| | |
|---|---|
| 1 **Use of Proceeds** | *The issuer should **declare eligible Green Project categories** in the Use of Proceeds* |
| 2 **Process for Project Evaluation and Selection** | *The issuer of a Green Bond should **outline the decision-making process** it follows **to determine the eligibility** of an individual investment using Green Bond proceeds* |
| 3 **Management of Proceeds** | *The **net proceeds** of Green Bonds **should be moved to a sub-portfolio** or otherwise tracked by the issuer* |
| 4 **Reporting** | *Issuers should **report at least annually on the specific investments made from the Green Bond proceeds*** |
| **Assurance** | *There are a variety of ways for issuers to obtain **outside input**, including **second party consultation** (hiring an expert consultant/firm with climate expertise), **publicly available reviews and audits** (expert consultant or auditor), **3rd party, independent verification/certification** (standards intended for use by accredited 3rd parties to certify Green Bonds)* |

# Green Bond Market Highlights

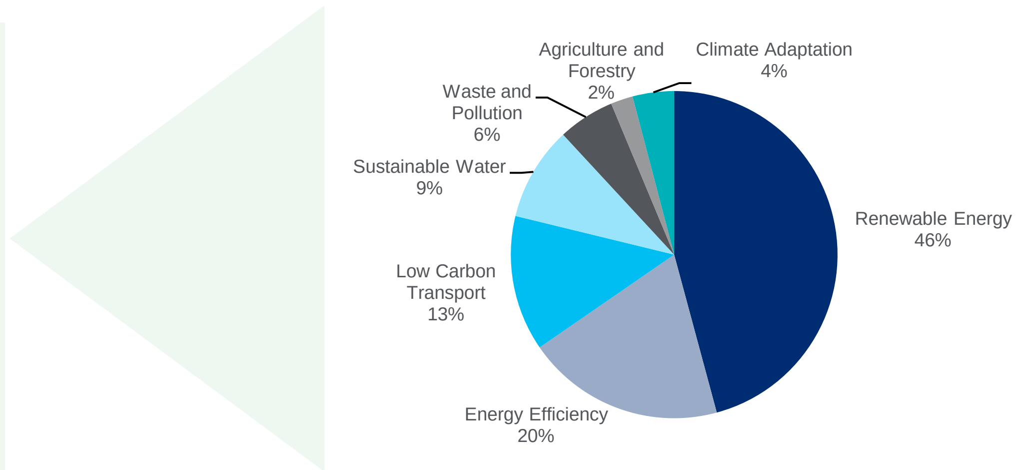
2015 saw a rise in the number of investors seeking to invest capital in products that support environmental sustainability. The growth in the number of investors will incentivise further growth in the green bond market in 2016.

## Global Green Bond Issuance



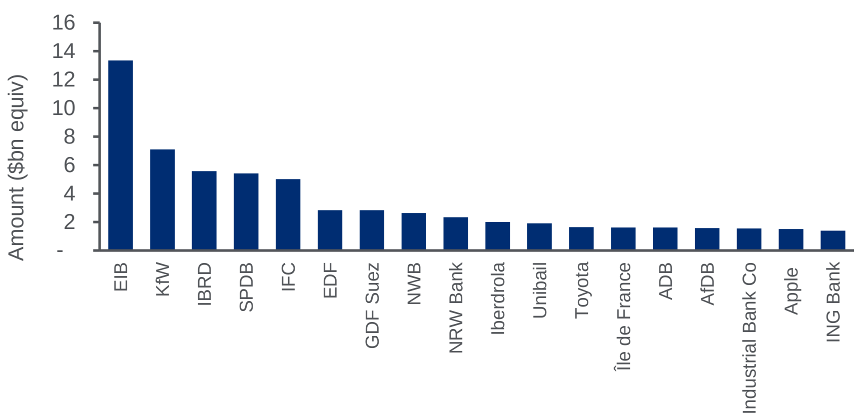

*Source: Climate Bonds Initiative*

## Green Bond Use of Proceeds




*Source: Climate Bonds Initiative*

## Top Green Bonds Issuers




### Challenges in the Green Bond Market:

- The lack of secondary liquidity prevents some asset managers from participating
- Pricing green vs non-green -- should there be a price incentive to green bond issuers?
- Strict definitions and green standards can act as a barrier to entry to some issuers

### What will help grow the market further?

- The growth of the market size last year has caught policy attention; participants expect this to be the key driver of growth in the green bond markets this year and in the future
- Should incentives to issue green bonds be introduced , for example–
  - Pensions have to invest a certain % in green bonds
  - Favourable tax treatment for green bonds -- capital weighting?
- Repeat issuers (eg. IBRD has issued 100 green bond transactions so far)
- Further diversification of issuer types

*Source: Citi, Bloomberg, Dealogic and Climate Bonds Initiative (As of July 2016)*

# 3. Infrastructure Financing

# Global Growth Challenge: The Infrastructure Financing Gap

- The world needs to invest $3.3 trillion a year to approximate a base case of infrastructure needs, or 3.8% of GDP, according to McKinsey. Others estimate that the global need is closer to $ 4 Trillion per year
- Governments spend 2 - 3.5% of GDP on average on infrastructure
- Given the pressures on fiscal budgets, governments are likely to spend between 2 - 3% of GDP on infrastructure
- This leaves a gap of up to $1.5 Trillion per year for the private sector to fill
- Infrastructure Project Finance (private sector funded debt & equity) currently accounts for $400 billion per year

Source: Citi, McKinsey (2015)

# Key Benefits of Project Infrastructure Finance

- **Limited Recourse to Sponsor**
  - Project Finance raises funds for independent projects and allows for limited recourse to the project sponsor
  - Debt is raised on the merits of the project rather than the credit of the sponsor
  - Clear segregation of the assets from the sponsor's other activities – investors' or lenders' recourse is only to the project, its cash flows and contracts
- **Off-Balance Sheet Treatment**
  - Project debt is frequently not consolidated to the sponsor
- **Optimize Risk Allocation**
  - Allocate risks to the most logical parties, with the risks that remain unallocated or unmitigated determine the risk of default
  - When projects are in construction, key risk mitigants include:
    - Experienced and creditworthy Engineering, Procurement & Construction ("**EPC**") as well as Operation & Maintenance ("**O&M**") counterparties
    - Certain credit enhancements mitigate additional risks (e.g., debt service reserve account ("**DSRA**"), O&M reserve account, working capital reserve account, cash flow waterfall structure, step-in rights into key project contracts, etc.)
- **Strong Market Appetite**
  - Despite a limited number of bankable projects, there is significant appetite for project finance debt (greenfield and brownfield) from international and local banks as well as from a diverse pool of institutional investors
- **Supports Higher Leverage and Long Tenors**
  - Higher leverage and longer tenors available compared to corporate debt given projects' long dated cash flow generation
  - Can help pierce sovereign rating in "dollarized" economies

# Corporate vs. Infrastructure Bond Considerations

| | Corporate Bond | Infrastructure / Project Bond |
|---|---|---|
| **Issuer:** | • Issuer is typically sponsor parent company<br>– Credit analysis of sponsor<br>– Driven by company accounts | • Issuer is special purpose project company<br>– Collateral is the project itself<br>– Cash flow is "king" |
| **Term / Amortization Structure:** | • Overwhelmingly bullet<br>• Traditionally 5-, 7-, 10-, or 30-year benchmarks<br>• Typically unsecured<br>• Limited number of covenants covering maintenance of business purpose, asset sales, etc.<br>• Typically no restrictions on incremental debt or dividend payment<br>• "Soft-bullet" structures are occasionally seen in the market | • Typically amortizing based on a minimum and average Debt Service Coverage Ratio ("**DSCR**")<br>• Maturity and weighted average life are bespoke<br>• Incurrence based tests with ratings affirmation for material project contract changes and incremental debt for capex expansion; restricted payment test for dividends |
| **Ratings:** | • Principal qualitative focus will be on scale, competitive position over bond life, industry risk and diversification of revenue<br>• Quantitative factors will focus on the Issuer's capital structure, leverage and liquidity profile<br>• Book equity typically a permanent element of the structure<br>• Core financial metrics include Debt/EBITDA, Funds From Operations ("**FFO**")/Debt and interest coverage | • Principal focus will be on the quality and stability of cash flows over the bond life based on contracts / counterparty risk<br>• Collateral structure is key to show investors can effectively step-in and replace the Issuer's management and operations if necessary to service debt<br>• Core financial metric is DSCR test plus liquidity enhancements for unexpected operational issues |
| **Investors:** | • As a 144A, broadest universe of participants in the capital markets for credit (excluding investors that require SEC registration)<br>• From a trading perspective, investors typically favor the perceived greater liquidity offered by a bullet bond | • Slightly narrower 144A investor base due to amortizations, more than compensated for with depth of dedicated demand in U.S. insurance companies' infrastructure & project books |
| **Pricing:** | • Pricing via relative value to closest credit comparables / benchmarks, adjusted for curve and rating | • Pricing built up based on relative value to equivalently rated corporate credits in same industry, other infrastructure bonds (regardless of sector), adjustments for a wide range of structural considerations, as well as differing relative value considerations between 144A investors and dedicated infrastructure investors |

# Infrastructure Risk Assessment Framework

The general risk assessment framework to be applied to infrastructure includes key factors such as project-level risks, transaction structure (incl. financing structure), ownership support and business / legal environment.

**Key Considerations**

**Ownership Support**

- Strategic importance of assets; corporate governance considerations
- Project fundamentals

**Single Asset Risk**

- Technology
- Performance thresholds
- EPC and O&M contracts
- Reserve accounts

**Construction Risk**

- Approval permits and licenses
- Completion guarantees
- Feasibility reports

**FX Risk**

**Economic Risk**

- Market environment
- Volume risk
- Variable cost risk
- Price risk
- Regulatory environment

**Mitigating Factors**

- Off-take, supply and O&M agreements
- Adequate debt service coverage ratios
- Operational track record
- Government sponsorship and regulatory considerations
- Alignment of stakeholder interests
- Robust tariff structure

**Structural / Contractual Foundation**

- Investor / Lender protection
  - Amortizing debt
  - Change of control
  - Min Debt Service Coverage Ratio ("**DSCR**")
  - DSRAs
- Limitations on additional debt and shareholder distributions
- Security package
- Bankruptcy remote special purpose vehicle ("**SPV**")
- Trustee / cash flow waterfall structure

**Typical Composition of Analytical Team**

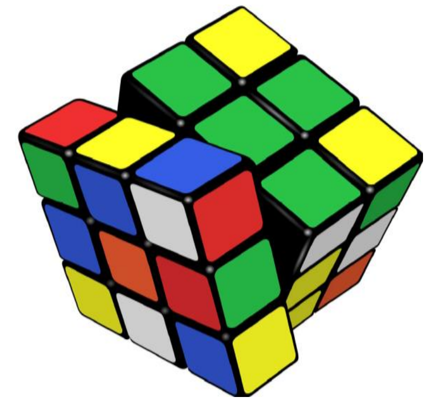
| Industry Expertise | Regulatory / Legal Expertise | Project Finance Expertise |
|---|---|---|
| *Sector Specialist* | *Local Analyst / Sovereign Analyst* | *Project Finance Analyst* |

→ **Project Finance Assessment**

# Unlocking Capital and Infrastructure Bottlenecks

Despite several variables that constrain the unlocking of incremental debt capital for infrastructure, bank lending remains robust in certain realms.

## Opportunity



- Debt, in USD, is the largest pool of capital available for credit risk globally, provided primarily by banks, pensions, and insurance funds
- Furthermore, project finance is, fundamentally, a **low loss given default trade** for investors
- There is also potential to further expand the bond market to finance infrastructure, as **only 7% of project debt in 2015 came from the bond market**

## Traditional Supply-Side Infrastructure Barriers

- **Limited bankable transactions** that generate sufficient returns and government funding to be commercially viable
- **Specific skill set** required to **allocate risks** to those best able to absorb them (some must be retained by the government, guarantor and private sector) and determine contractual or reserving-like mechanisms
- **Construction risk** in large scale-projects can lead to significant cost-overruns and delays
- **Foreign exchange** risk can particularly occur in dollarized economies where borrowing does not match the underlying project revenues
- **Limited dollar funding** to refinance debts on a periodic basis
- **Banks → Institutional Capital "chicken-and-egg"** dilemma occurs when clients use banking relationships to deliver long term funding, which provides more flexibility in project stress v work through a problem with transactional investors
- **Inherent incompatibility between HY and project finance** as deals often have leverage levels substantially above an IG or NIG corporate and revolve around similar asset classes (ie power-plants), while HY investors prefer industry diversity and do not usually look for long duration and stable cash flows
- **Limited secondary market and indexation** limits the investor base, as Project Finance bonds are typically HTM, smaller and less liquid, so investors and banks take smaller positions

# Public Sector Infrastructure Financing Best Practices

**How can Governments achieve best practices for infrastructure financing?**

- Prioritize
- Ensure transparency in the bid process
- Educate all stakeholders

- Allow flexibility in the contractual process for bankability considerations
- Standardization of government obligations

- Utilize pension fund community
- Leverage multilateral capabilities
- Development bank aligned

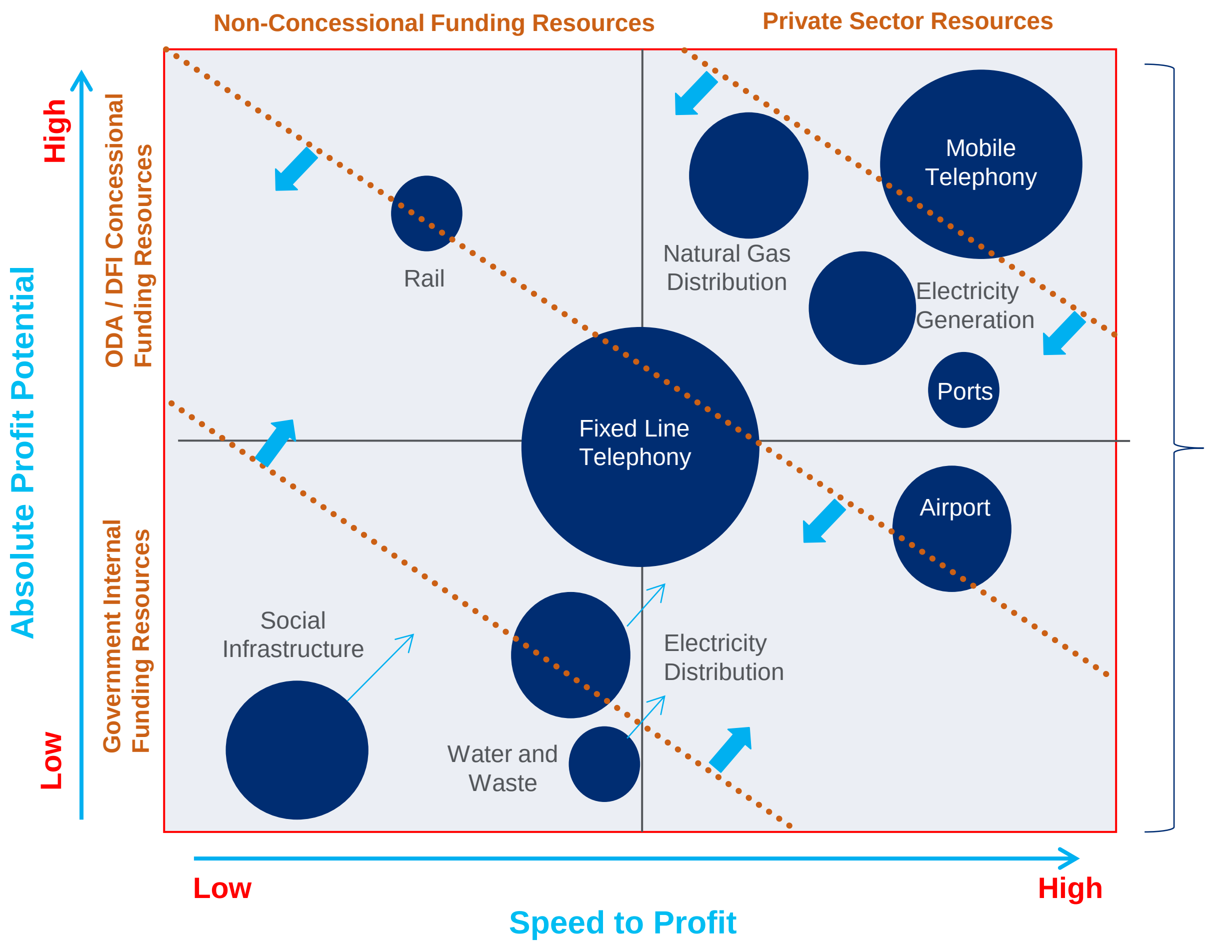
- Not just bank market – capital market solutions
- Develop local currency funding

# 4. Blended Finance

# Blended Finance: Sector Impact of Mobilizing Private Sector

Leveraging grant resources and deeply concessional funds, typically used for social investments (e.g. health and education), to mobilize funding for highly "additional" projects to achieve commercial returns, will unlock private sector funding for a wider array of SDG challenges.  Furthermore, BF will increase the efficiency, effectiveness and volume of the public resources at hand.

**Shift in Sector Funding**




### Current Landscape

- Commercial funding goes to those sectors with the highest and fastest profit potential (e.g. mobile)
- The private sector is also typically predominately involved (often via PPP) in natural gas, electricity generation, ports, airports and rail projects
- Concessional funding comes in once profits and speed fall for example in electricity distribution and fixed line telephone
- Finally, government resources are typically used for social infrastructure projects because of the low, unquantifiable and long dated returns, as well as the inability to rely on the private sector social needs

### Blended Finance

- If government and concessional funding is used in the capital structure of projects and sectors with greater profit potential, private sector capital will simultaneously crowd in, as the sectors on the fringe can then meet private capital return hurdles

Source:  Mckinsey

# A New Approach to Development Financing

Evolving developments in ODA, DFIs, Capital Markets, Remittances & Banks are changing the financial landscape and expanding the available wallet for infrastructure & SDGs, as it becomes critical to leverage public sector resources to mobilize greater investment. Donor governments can aspire to do more in partnership with Agencies and the private sector.

## Innovations in Development Financing

Public

- **ODA**: The objective of donor governments to achieve greater economic and social impact with their aid dollars, combined with EM countries migrating to middle-income status, has prompted the conversion of "grants" to "equity" thinking
- **DFIs**: Sovereign stakeholders are demanding DFIs "do more" with existing risk capital, promoting a move from direct lending to "crowding in" the private sector though greater use of guarantee programs that also consume less capital

Private

- **Capital Markets**: The emergence of socially-responsible impact (SRI) investors is driving the reality of achieving both risk-adjusted financial returns and social benefits though targeted investment and demand for greater disclosure and accountability
- **Remittances:** The destination of repatriated funds is shifting from consumption to investment and the money is looking for appropriate channels/instruments that can deliver both economic and social returns in the home country
- **Banks**: Basel III and other regulatory issues are limiting appetite for long tenors and specialized risk exposures requiring broader risk allocation and greater risk defeasance solutions

## Key Opportunities

- Converting the historically dominant ODA and remittances inflows into Portfolio and ECA/DFI inflows, i.e., expand funding wallet
- Penetrating new segments, e.g. social infrastructure, through risk allocation and risk defeasance to non-traditional providers, e.g. NGOs
- Refinancing brownfield assets in local markets with targeted guarantees or creating SPVs with hybrid capital structures that generate sufficient risk-adjusted returns to attract private capital
- Providing SOEs access to capital markets via credit wraps
- Structuring hedging solutions using third-party guarantees

See appendix for more on blended finance and infrastructure bottlenecks

# Blended Finance: New Financing Framework or Traditional Competitive Strength?

Blended Finance is the strategic use of public resources and funds to mobilize private capital by creating bankable structures through the allocation of risks and the blending of returns. Over the past decades, Citi has developed an unparalleled track record, expertise and experience in Blended Finance through our Export Agency Finance Business.

- The Third Conference on Financing for Development in Addis Ababa in 2015 established "Blended Finance" as a "new" financing framework to help reach the Sustainable Development Goals (SDGs), which intend to shape the global development priorities for the next 15 years
- Blended Finance introduces market-based instruments (first loss guarantees, equity, subordinated debt and bespoke guarantees) supported by non-traditional public resources providers (Official Donors, NGOs, Foundations and Aid Agencies) to enhance greater risk allocation and commercially-acceptable returns.
- The targeted placement of ODA, particularly, in hybrid capital structures can transform an un-bankable project with insufficient financial returns into a commercially viable and operationally sustainable transaction. This transformation is realised through adjusting the risk and achieving the targeted returns required by private investors.
- Allocating a significant portion of ODA to instruments, such as specific-risk guarantees and first loss equity, will attract and provide leverage for private sector capital This blending of finance can deliver a win-win outcome whereby the project comes on-stream and produces the social and economic benefits as targeted by the traditional allocation of public resources while also generating sustainable and required returns for the private sector investors.
- Typically, the more a project can generate commercially accepted returns the less amount of ODA will be needed to attract the necessary private investment. For high non-commercial transactions, ODA can also be used to cover particular risks that can ameliorate the acceptance criteria for other donors and development assistance providers.

**Blended Finance financial instruments:**

| Financial Instrument | Grants | Junior equity | Flexible / concessional debt | Market rate debt or equity | Guarantees |
|---|---|---|---|---|---|
| Characteristics | Funds costs and activities that lead to investment | Accepts higher risk in exchange for social, environmental and economic impact, typically in a position to take the first losses | Favourable terms shift risk-return profile | Investment on same terms demonstrates viability and provides investor comfort | Risk reduction tools that protect investors against capital losses or provide credit enhancement |
| Place in capital structure | Grant<br>Debt<br>Equity | Debt<br>Equity<br>Junior Equity | Debt<br>Flexible Debt<br>Equity | Debt<br>Equity<br>Debt<br>Equity | Guarantee<br>Debt<br>Equity |

Source: Citi, WEF

# 5. Applied Technology to Development Challenges

# Tech for Integrity: Applying Technology to the SDGs

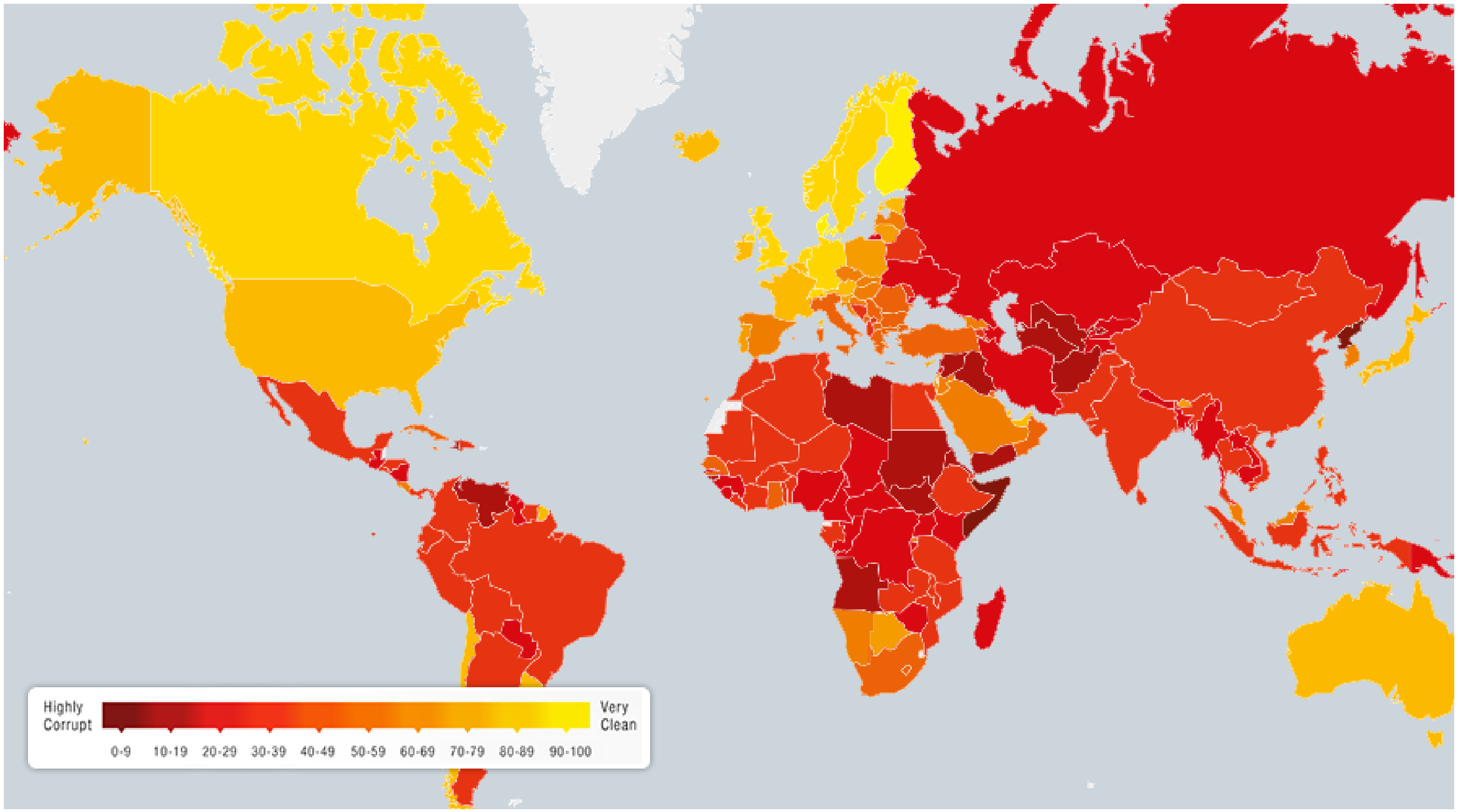
A World Economic Forum ("WEF") survey showed that 67 of 144 economies identified corruption as one of their top three challenges and while estimates vary, the WEF puts the cost of corruption at 5% of global GDP, or ~$3.7T.

Annually ~1.6B people pay bribes amounting to *~$1T*

*~$20T* worth of undeclared assets are held in offshore tax havens.

In 2011, Africa lost *~$77B* due to illicit financial flows.

~58% of people across African said corruption is on the rise

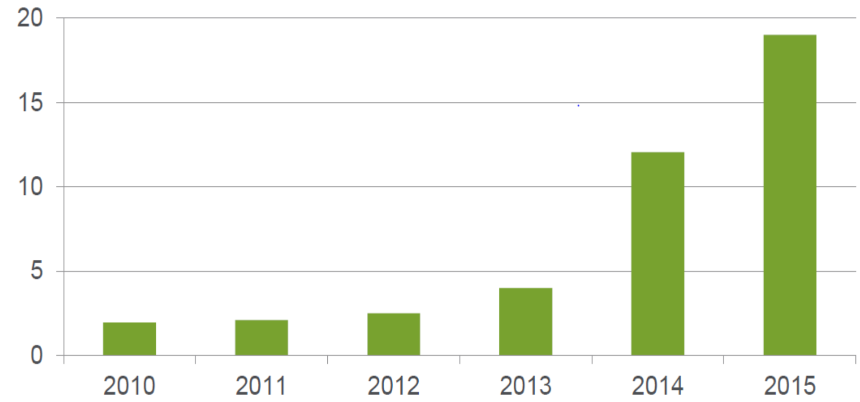


# Growth of Mobile Payment Ecosystems

Today, there are over 200 digital currencies in existence, the most well known and first being bitcoin, a decentralized “cryptocurrency”, developed on blockchain technology.

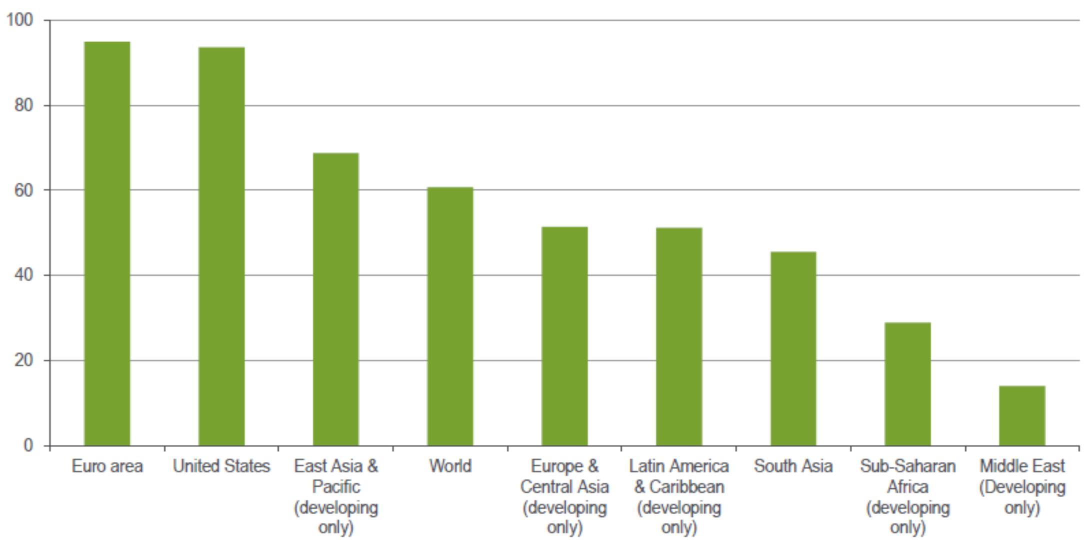
- The fundamental objective of mobile payment ecosystems is **to replace cash**
- Replacing cash will open up the door to a myriad of financially inclusive digital developmental solutions
  - A mere 10% improvement digitizing monetary flows has the potential to shift over $1 trillion dollars into the formal economy
  - $350-$400 billion can be saved by converting cash payments to digital
- 70% of the $19 billion spent on FinTech investments in 2015 was focused on the last mile, where the electronic payment chain breaks down

**Private Investment in Global FinTech Companies ($bn)**

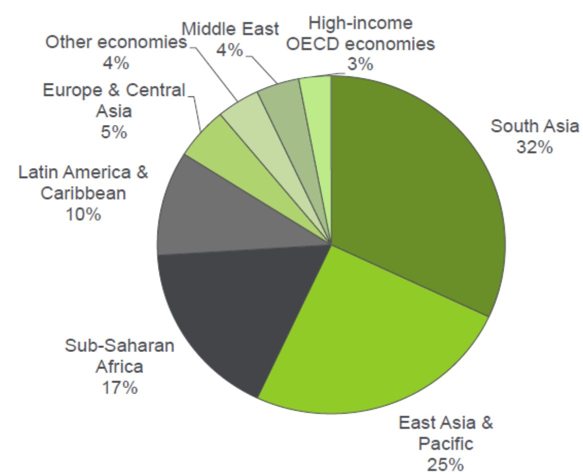



Source: Citi and CB Insights; Includes first around and subsequent private investments.

**Percentage of Population (15+) with a Bank Account (2014)**

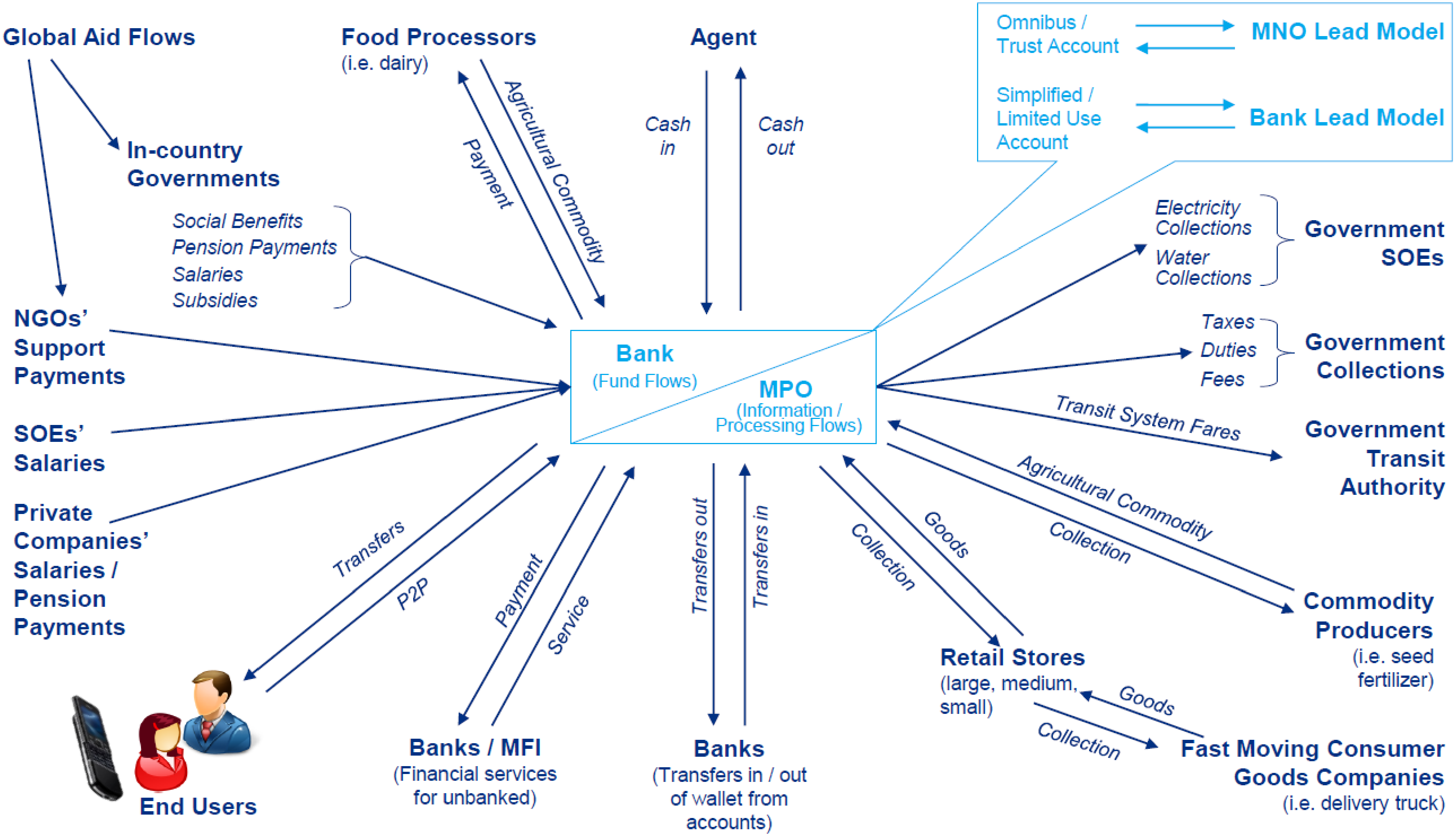



**Distribution of Unbanked Population by Region (2014)**




Source: Citi Research, WB Financial Development Index

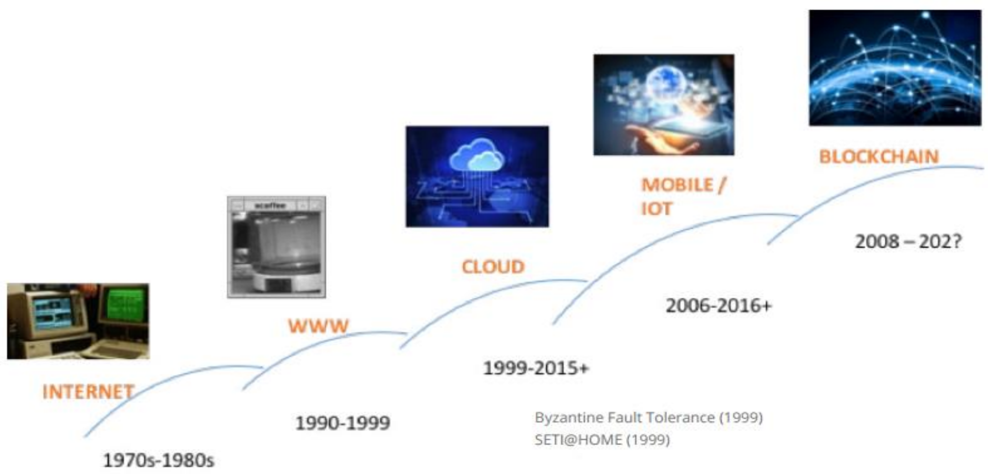
# Mobile Money Ecosystems and Financial Inclusion



# What is Blockchain?

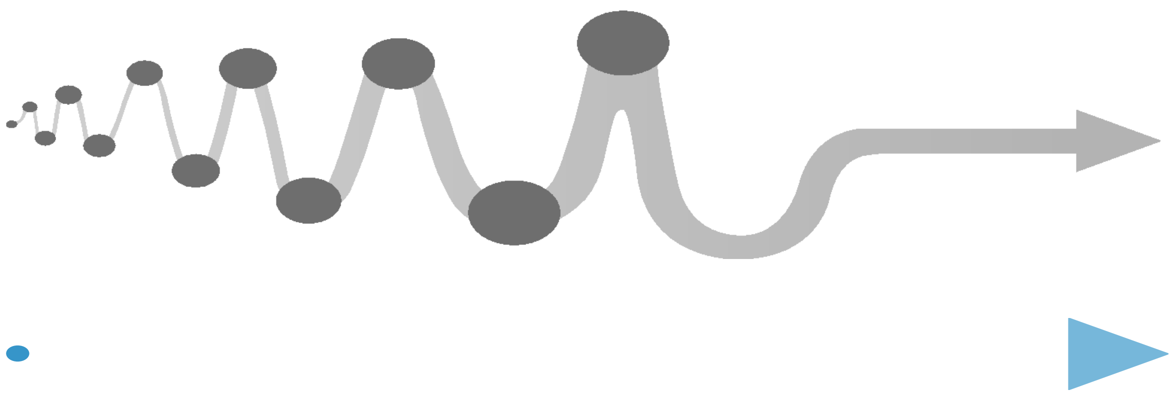
Blockchain, a platform that records and verifies transactions on a distributed database, or ledger, and is transparent, traceable and immutable.

## Latest Game Changing Innovation




- A blockchain consists of blocks that hold batches of valid transactions. Each block contains a time stamp and a link to a previous block forming a chain
- The concept of a **distributed ledger** is not only potentially disruptive to centralized clearing as we know it, but also to all the legacy norms imbedded in and around paper currency, from economic policies and monetary policies to security policies and core social values

## Blockchain Streamlining Flows



**FINANCIAL FLOW**

- Requires trusted, centralized intermediaries
- Batch clearing and settlement.
- High fees and costly infrastructure

**BLOCKCHAIN**

- No (or fewer) intermediaries required
- Near real-time processing and management
- Low fees and reduced infrastructure cost

# Permissioned Blockchain, Digital Currencies and Smart Contracts

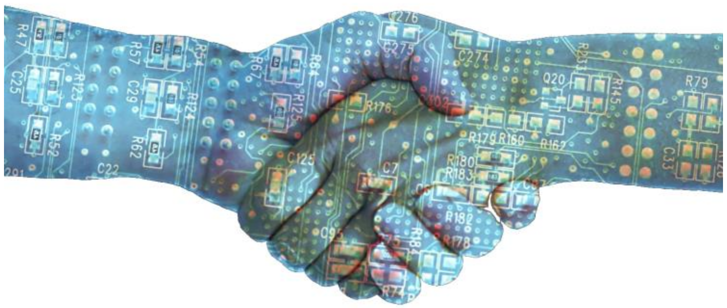
The “exaptation” of Bitcoin’s blockchain technology to a world of many blockchain platforms, with wide ranges of permutations on the distributed ledger theme, including where there is, in fact, a third party of trust controlling and administering the chain.

## Central Bank Applications

- Some platforms will increasingly be permissioned and centralized, where a government or Central Bank can have special permission to control a “master ledger”, with layers of permissioning depending on circles of trust
  - Potential Central Bank owned digital currencies will strive to utilize the underpinning of a blockchain platform, while re-introducing the centralized safety, trust, reliability and “regulatable” components of their role

## Smart Contracts

- Additionally, smart contracts, contracts made digital that execute autonomously based on certain programmed conditions, will allow governments to electronically audit digital contracts across an entire procurement supply chain, including the financing components
  - Governments could then immutably record real estate ledgers, data related to official development assistance, government assets, data related to monitoring of customs duties, or taxes of any kind
  - Estonia, Honduras, Ukraine, India, among others, have already implemented such blockchain platform solutions



# Applying FinTech Solutions

- As the digital age pulls back the curtain on today's global “integrity” issues, the systematic application of technology will give us an opportunity for **game changing progress in the fight for integrity**
  - As blockchain and its derivatives come to life, the potential of monster size **big data analytics, artificial intelligence, machine learning and predictive analytics** will allow powerful virtual “search and destroy” missions to be waged against corruption over the internet
- **Open Application Programming Interface (Open-API)**, tools that enable software systems to communicate, will increasingly become the norm, with the opportunity to take an Appstore approach to technology solutions that solve government problems
- Promotion of technologies that automate and reduce the cost of the **Know Your Customer (KYC) and AML-CFT** processes will also reap enormous rewards for the regulatory community

- Additionally, advances in biometrics (facial, voice, and fingerprints) will allow **digital and multi-factor identity** to combine with device, location and behavioral identity techniques, which will lead to a leapfrog in progress in the identity space, thereby radically changing the dynamics of the financial inclusion challenge

# Government Use Cases and Application

- We have seen governments successfully implement mobile wallet payment and digital identity solutions; however, given the possibilities of existing and frontier technologies, we have only seen the tip of the iceberg
- A number of Central Banks are constructively engaging with these new innovations to understand them, use them, adapt them and regulate them
- Regulators, like the Monetary Authority of Singapore, are proactively investigating, sandboxing, and kicking the tires to help shape their future use
  - Issues like thresholds of privacy, digital safety, security and protection, and citizen experience (CX) need to be addressed
  - Such regulators will be the ones that dominate the new field of “RegTech”, where the regulators themselves use cutting-edge technologies to continue to successfully perform their function in the digital age
- While many of the emerging technologies will have to be adapted, tested, scaled and perfected, the bigger challenge may well be in changing societies’ paradigms

Citi believes that sustainability is good business practice. We work closely with our clients, peer financial institutions, NGOs and other partners to finance solutions to climate change, develop industry standards, reduce our own environmental footprint, and engage with stakeholders to advance shared learning and solutions. Citi's Sustainable Progress strategy focuses on sustainability performance across three pillars: Environmental Finance; Environmental and Social Risk Management; and Operations and Supply Chain. Our cornerstone initiative is our $100 Billion Environmental Finance Goal – to lend, invest and facilitate $100 billion over 10 years to activities focused on environmental and climate solutions.