CARDANO DEVELOPMENT

EMPOWERING FRONTIER ECONOMIES

Cardano Development's

Theory of Change

In collaboration with Evidence. Ideas. Change.

Preface

It is with great pleasure that we present the results of our collaboration with the **Overseas Development Institute (ODI)** to formulate our **Theory of Change** and development-impact philosophy.

We have evolved rapidly in recent years, from housing a single innovative development finance platform, The Currency Exchange Fund (TCX), to become a thriving innovation hub with a number of successful and highly diverse businesses, as well as a very active incubation platform for start-ups.

Some of these start-ups have already evolved into scaled-up market leaders, while others are still in the nascent phase. Cardano Development has become a versatile, multi-business incubation platform for financial innovation that increases, deepens and improves investment in developing countries.

As our activities have grown, we have felt compelled to more clearly set out our business philosophy. Given the diversity of our business concepts, this was no easy task. Cardano Development is not a mainstream debt or equity investor, but rather a creator of businesses that enhance the functioning of capital markets through the provision of targeted financial products or services, working with both clients and investors to realise inclusive, resilient and sustainable growth in developing economies around the globe.

We apply our trade to a wide set of solutions that may, to the casual eye, look like a random set of opportunities. In fact, they are the result of a rather methodical approach to financial-sector innovation. With this document, we have asked ODI to describe our method and to formulate a coherent Theory of Change to better guide our strategic thinking and communicate our vision of success.

CARDANO DEVELOPMENT IS NOT A MAINSTREAM DEBT OR EQUITY INVESTOR

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An introduction to Cardano Development

Cardano Development (CD) is an incubator of innovative business concepts that deliver disruptive and inclusive financial services in developing countries.

With a solid foundation built on experience and a broad network of partners, we initiate, implement and manage institutions that provide solutions to gaps in financial markets in Africa, Asia, Latin America and emerging Europe.

We develop new business concepts based on our understanding of the needs of households, companies and institutions in developing countries. The financial markets we deal with are typically characterised by low levels of development, low liquidity and low operating efficiencies; the solutions we create aim to disruptively improve access and service levels in targeted, specialist niches.

We capitalise our companies with the participation of local and international investors whose needs and objectives we understand well, combining various sources, including public agencies, development finance banks and institutional investors. We implement our business plans with a solid operational and financial risk-management focus.

CD is first and foremost a people-driven institution. Innovation in complex environments requires drive and dedication, which come from highly skilled and committed management teams that we firmly support with an open corporate culture, highly focused service orientation and accountability.

Joost Zuidberg
CEO - Cardano Development

Active mandates

As we have successfully matured a number of innovative business concepts, CD is now the established manager of a number of high-profile financial services companies targeting developing countries.

TCX provides long-term currency hedging in illiquid emerging- and frontier-market currencies. Its development mission is to de-risk development finance by removing the currency and interest-rate risks associated with hard-currency financing in developing countries. By acting as a dependable market maker in these FX swaps, TCX provides certainty and dependability to clients. By onselling the currency risks to private investors where possible, it promotes capital-market development.

Frontclear is dedicated to stable and inclusive money markets in EMDCs. It unlocks access to global and local interbank markets for EMDC financial institutions by providing credit guarantees to cover counterparty credit and related risks. Frontclear complements its risk bearing capacity with technical assistance to remove barriers to money market development, working closely with regulators and industry to build the required money market skills, regulatory frameworks and market infrastructure needed to improve liquidity.

GuarantCo provides local-currency, unfunded credit solutions for infrastructure finance in Africa and Asia. By de-risking transactions, GuarantCo creates bankable deals that match the investment appetite of local and international institutional investors. This increases the supply and improves the financing terms of long-term local-currency funding for infrastructure projects.

BIX Capital provides debt financing to small and medium-sized enterprises (SMEs) active in the distribution of high-impact appliances (such as high-end cookstoves and water purification systems) for households at the base of the pyramid, primarily in sub-Saharan Africa. BIX Capital utilises an innovative results-based finance structure, based on the monetisation of carbon credits and other impact certification mechanisms, to provide financing in high-risk environments.

Water Finance Facility will provide long-term, local-currency finance to water and sanitation infrastructure in Africa and Asia. Using its financial structuring expertise, it will mobilise de-risking with development finance sources (such as guarantees) and local-currency debt capital from domestic institutional investors. It will also assist its clients with project development and transactional support to create bankable deals.

ILX is establishing a scaled-up emerging-market private credit fund to co-invest in senior debt provided by multilateral and bilateral development finance institutions (DFIs). The ILX concept balances risk and return to create long-term value for mainstream institutional investors and to offer a uniquely scaled opportunity in high-impact assets. Its development mission is to give mainstream institutional debt capital an entry into development finance at scale.

AGRI3 Fund will provide guarantees and subordinated loans to commercial banks and other financial institutions to mobilise capital by de-risking and catalysing investment opportunities that will actively prevent deforestation, stimulate reforestation and contribute to efficient, sustainable agricultural production. This will positively impact rural livelihoods in developing countries.

CD Savings

CD Savings is a joint venture with the National Stokvel Association of South Africa (NASASA) to create a regulated cooperative bank for low-income savings groups ('Stokvels') in South Africa. The institution will focus purely on offering savings products to the unbanked, with real positive interest rates and improved physical security in handling cash. Its development mission is to materially improve financial inclusion and resilience. CD Savings is working closely with the South African Reserve Bank and regulators to realise this product.

IMFact provides affordable working capital to SMEs in developing countries through the pooled factoring of SME-to-SME receivables. Calibrating the funding ratio to the risk of the invoice pool allows for high-quality risk management in a segment that has traditionally been very difficult to manage. IMFact's business model is commercially rolled out with country- and sector-specific focus. IMFact's development mission is financial inclusion to the 'missing middle'.

DLM Finance is a unique back- and mid-office support company, which is the backbone of CD. DLM's services include deal management, valuation, collateral calculation, payment handling, accounting, risk management and (impact) reporting. DLM provides a proprietary, tailor-made IT-infrastructure that covers all functionalities required for fund management in frontier markets. It also handles hosting, application management, functional support and system enhancements.

01

What's needed in finance for development?

CD conducts its activities in developing countries where finance is an essential ingredient for inclusive, sustainable and resilient economic growth.[1] However, financial markets in the developing world remain critically constrained and inefficient. Overall, finance in developing countries is insufficient in scale, too expensive and too short-dated to support economic growth and is a specific constraint on the delivery of the Sustainable Development Goals (SDGs). CD's mission is to apply its talents and energy to addressing these limitations, particularly in areas where it has built up know-how and a network of partners.

Constraints include banking systems that are too small and concentrated, with low levels of savings mobilisation, 'missing markets' for risk management and inefficient operations that lead to a high cost of borrowing and the exclusion of large parts of the population. Low savings rates and high liquidity premiums lead to weak capital markets, low liquidity and low price transparency. Emerging and frontier markets also suffer from repeated financial instability – in turn associated with sharp increases in poverty.

From this low base, the state of financial markets in a number of developing countries has evolved in recent years. Substantial progress is being made towards deeper, more active, efficient, resilient and inclusive financial systems, with improved regulatory frameworks that promote long-term and sustainable investing. This positive recent trend means that the historical gaps between the supply and demand of capital have shrunk to levels that can be bridged by catalytic agents that can connect the dots. De-risking strategies can be used, as needed, to mobilise capital or remove operational and knowledge barriers through effective product design or the establishment of transaction platforms.

The emergence of more sophisticated domestic and offshore (local-currency) capital markets allows for the creation of market-shaping interventions sponsored or supported by development capital, created to catalyse investing activity by private mainstream capital (both local and international). Scarce concessional capital provided by official donors and DFIs can now be put to very efficient use to catalyse the emerging private interest and to develop truly demand-driven financial-market solutions that address an existing gap.

It is in this dynamic and evolving field that CD operates, positioned between local clients and local or international financial markets. We create value by bridging the needs of a diverse group of stakeholders that together constitute a functioning financial market. The businesses we create and manage perform a specialist market-catalyst function, managed by professional and focused teams, supported by our ecosystem and capitalised by like-minded development finance partners. The financial ecosystem that we create frequently uses stakeholder capacity-building, regulatory development and training for financial-market shaping.

Our market-shaping interventions aim to use de-risking tools offered on widely accessible operational platforms that allow market actors to accelerate financial development – especially in domestic markets and in offshore local-currency markets – creating demand-driven and efficient solutions at scale. In a growing number of developing markets, such platforms are encouraging local institutional capital to increase its participation in growth capital.

When done with an intention to mobilise funds at scale, these interventions can be truly catalytic: with relatively modest capital, a large multiplier in private capital can be mobilised over time. However, successful innovation in market-building requires a firm resolve to innovate radically and take on the risk of failure in untested markets, and acceptance to allow markets to grow where demand leads. It also requires development finance actors to demonstrate a deeper level of operational involvement in the local financial-market ecosystem, realising new ways of delivering value.

Financial markets thrive with enhanced liquidity and volume. Unlocking investment flows frequently causes further activity to follow, so that early catalytic work is enhanced by a positive feedback loop.

FINANCE IS AN ESSENTIAL INGREDIENT FOR INCLUSIVE, SUSTAINABLE AND RESILIENT ECONOMIC GROWTH.

1. We present a detailed discussion of the academic evidence base relating to this discussion in the appendix.

02

The CD pathway to change

Founded in 2007, CD has created a number of innovative financial business concepts in developing countries that have since developed into world-leading institutions, directly mobilising more than USD 1 billion of financing and contributed to market-building in frontier and emerging markets.

Following on from this success, it is currently working on a pipeline of five new start-ups with similar ambition and potential. This section discusses how CD approaches its strategy by maintaining a consistent set of value-adding principles and targeting high-impact goals, as formulated in a Theory-of-Change structure.

Inputs

To achieve a pathway to change, CD has, over the years, developed a unique set of inputs that it uses. Each CD initiative is intended to develop into its own highly distinctive niche, but all share a number of core characteristics that make them typical CD propositions.

The five typical CD inputs for inclusive and sustainable local financial markets are:

1 Risk capital

CD has established strategic partnerships with development **risk-capital** providers to bear running expenses prior to commercial start-up, either through its in-house incubator fund, JoDEA, or as third-party partners.

2 Networks and people

CD's businesses are created within a shared **network** of development institutions, banks and other financial-sector partner organisations that participate in our innovations through co-creation, seed capital or as start-up clients. CD's network is key to ensuring that its solutions are based on sound market assessment and feedback. As an established innovator, CD is able to attract a **unique team of professional and entrepreneurial talents**, highly skilled at developing successful start-ups, with a range of specialised expertise in risk management, innovation, and impact measurement and monitoring.

3 Risk managment

CD's business concepts are grounded in a **comprehensive risk-management approach** to capital and risk, in particular, applied to complex risk combinations in data-poor environments.

4 Back and mid-office

CD has developed a solid approach to operational control and administration that is well suited to governing dynamic start-ups. **Its back-office and support systems set-up** allows its development teams to better focus on the start-up's commercial and strategic elements. CD has also developed a unique capability in aspects of key portfolio management, such as valuation and quantified risk management in data-poor environments, as well as in specialist topics, such as impact reporting.

5 Technical assistance

To increase the effectiveness and capacity of the local financial-market ecosystem and its stakeholders, such as banks, non-bank financial institutions, insurers, pension funds, regulators and government institutions, CD companies deploy significant technical assistance funding. **Technical assistance** is channelled to transactional training or market assessments that provide insights and knowledge for the benefit of local partners and clients.

Outputs

Primary outputs

CD's critical risk-management know-how, coupled with its ability to form long-lasting local and international partnerships, presents the ideal opportunity to mobilise public and private funding. CD's clients include DFIs, international financial institutions and public agencies, such as ministries of finance, capital-market authorities or central banks, as well as a full spectrum of private investors, including socially responsible investors, private funds and institutional investors (such as pension funds and insurers). The majority of the concessional capital mobilised by CD has been provided by its development bank network, built up over the past decade. CD is also known for mobilising local private capital, predominately sourced from local institutional players that are willing to invest in infrastructure and critical public goods in their economy, such as water and electricity services.

CD works with local and global institutional investors to bring their vast pools of capital into frontier markets. Key has been the development of innovative ways to meet the fiduciary and regulatory requirements of institutional investors that can make investing in such markets difficult. This includes 'de-risking' deals by using guarantees to absorb 'first losses' and by creating diversified bond funds – both techniques make the risk suitable for institutional investors. CD's technical assistance provides advanced advice, structuring and capacity-building for clients in these specialist markets. In some cases, CD targets the legislative financial-market changes needed to shape the right regulatory framework to create systemic change in frontier markets.

Secondary outputs

The main objective of the intended output is to change the financial-markets business concept into a solid company that has the potential to scale to other countries. CD's business concepts are preferably local-currency oriented. Over time, CD has gained significant insights and learnings through its rich experience, network and data-driven way of working.

CD's innovations have crucial demonstration effects, illustrating how successful new approaches can be found, applied and developed – and showing that transactions can be commercially viable for private investors. CD achieves this by proactively sharing its knowledge and expertise throughout the development community, with a reputation as a thought leader, not only among clients, but with other stakeholders, such as policy-makers, regulators and end users. CD shares its insights and learnings through scientific publications, conferences, webinars and podcasts.

Such demonstration effects and thought leadership are critical, as they create the expertise, knowledge and conversations throughout the development community to facilitate the adoption of new ideas and further innovation. Greater awareness and understanding of risks, products and markets also leads to a virtuous circle, whereby better understanding of the risks leads to the adoption of better risk management and regulation, which, in turn, increases market growth and boosts financial stability.

Effects

Direct and indirect effects

The indirect effects of the local-currency business concepts developed by CD boost inclusive, sustainable and resilient economic growth. CD goes beyond just providing products. It partners with the local financial-market system to develop appropriate risk-management and pricing expertise and policies using unique datasets and models (such as pricing models and yield curves) tailored to frontier markets. This approach means that CD acts as a market catalyst for making emerging and frontier markets 'investible' and more 'efficient', thus helping to tackle one of the key barriers to the large-scale mobilisation of private finance for development. The deepening of local financial markets promises to bring stable, liquid and well-priced investment in local currency to relieve the financial constraints on economic growth (UNECA, 2016).

We identify five direct (primary) effects that are important indicators for more investible and more efficient local financial markets:

1 Increased funding for the SDGs

CD's financial risk-management products mobilise significant local and international institutional capital for investible projects in Development Assistance Committee countries. Tailor-made blended finance instruments, such as guarantees and currency swaps, create significant leverage.

2 Increased transparency in risk and pricing

In many frontier and emerging markets, there is a lack of public market data and information due to poor liquidity and an absence of mechanisms to publicly provide data, such as public exchanges or clearing houses. This deters potential market participants, because they cannot adequately conduct risk management, valuation and pricing. The financial risk-management tools and expertise that the CD companies utilise for clients and regulatory environments result in transparency. CD addresses the gaps and creates benchmarks that are otherwise absent or not working effectively. Such transparency – especially the availability of data and models – encourages greater participation in these markets by increasing the pool of public and private investors wishing to engage in markets that are otherwise illiquid and opaque.

3 Better financial products for local clients

The financial services CD develops in these (local) markets result in more stability for local clients, for example, through longer-tenor financing or lower cost. As transaction volumes increase, perceived risks are reduced and trust increases.

4 Increased investment opportunities

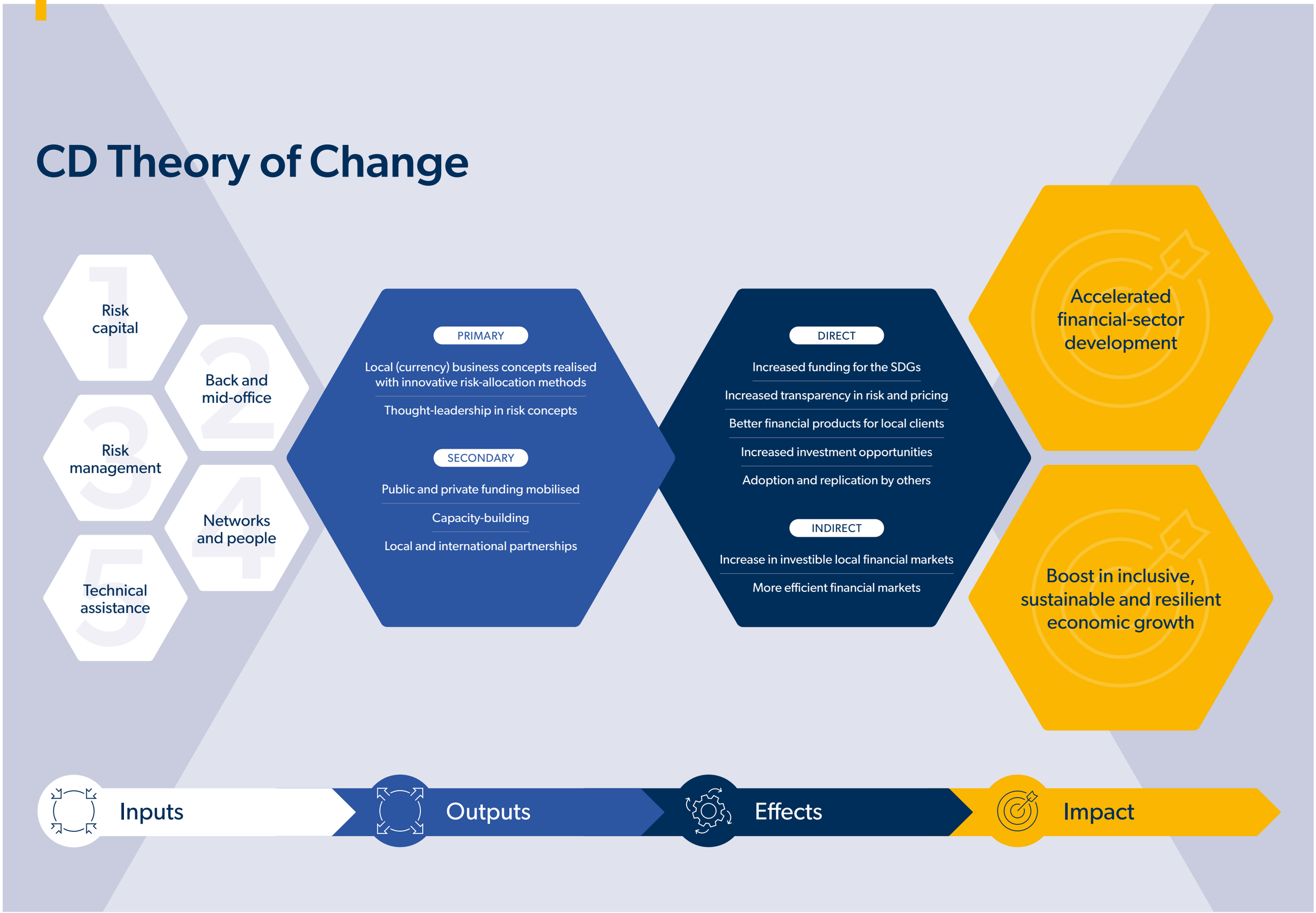
CD initiatives create investment opportunities for institutional investors that reduce risk, increase diversification, improve liquidity or enhance portfolio yield potential. Better financial risk products fuel the appetite of local and international investors to invest in local projects. CD also works closely with central banks and regulators to support the strengthening of financial markets through technical assistance and cooperation, making the local financial-market environment more conducive to investment.

5 Adoption and replication by others

More competition and a supply of similar local-currency risk-management products in frontier markets is an important driver of more investible and efficient financial markets. More competition and successful transactions make similar local-currency players more willing to enter the market and replicate our risk-management products and services in frontier markets, further improving the efficiency of the market. This is also an important driver of more investible financial markets, as efficiency directly affects the cost of investment and, when the cost is high, this deters investment in developing countries.

These direct and indirect contributions deliver the finance to boost inclusive, sustainable and resilient economic growth in frontier and emerging markets.

CD Theory of Change



03

Case studies

JoDEA's role in financing and incubating innovative solutions

CD houses an incubator called JoDEA to test and develop promising ideas and to deliver innovative and scalable market-shaping solutions in local currency and local financial markets.

JoDEA's core value is using donor funds[2] to finance the early-stage incubation of concepts that might otherwise struggle to get off the ground. It then combines finance and support from CD's team to develop these ideas into concrete solutions.

Current projects illustrate JoDEA's potential. Take, for example, tackling a problem that many private-sector firms face (especially small and informal ones), such as access to working capital (UNCTAD, 2016). JoDEA is supporting the development of a factoring business, IMFact, which includes a fintech platform to deliver efficient and accessible services for SMEs. IMFact is partnering with local and international DFIs[3] in Kenya, Morocco and Peru to build a critical mass of users.

JoDEA's core value is using donor funds to finance the early-stage incubation of concepts

JoDEA is also supporting the development of a savings product that will help to mobilise domestic savings in South Africa, with the potential to scale up to other countries. CD is partnering with the National Stokvel Association of South Africa (NASASA) to build a cooperative financial institution that will provide savings products, combined with financial and digital literacy, all delivered through a reliable fintech platform.

Savings products help households save for key life events and goals, such as education, healthcare and housing, increasing their resilience to shocks. A key innovation that CD has developed is to pool savings in a secure account at the South African Reserve Bank, with funds being invested with a low-risk return in inflation-linked government bonds.

This innovation will also help to support the challenge of domestic savings mobilisation by providing the return and security needed to attract savers into the formal financial system and by digitising their existing savings behaviour.

2. JoDEA is funded by KfW on behalf of the German Ministry for Development Cooperation.
3. Including Total Impact Capital, Medical Credit Fund, Capital Tool Company and FSD Africa.

GuarantCo
GUARANTEES FOR DEVELOPMENT

GuarantCo partners with the London Stock Exchange to dual-list local currency bonds and build the capacity of offshore investors

CD took over the management of GuarantCo in May 2016, through its subsidiary GuarantCo Management Company (GMC). Since then, GuarantCo has doubled its portfolio to USD 875 million (FY2019), won a number of prestigious industry awards and became a recognised leader in long-term local-currency credit solutions across Africa and Asia.

A key driver of cross-border capital flows is the perception of risk, and assessing that risk requires market transparency and price discovery. In most lower income countries, there is an information gap between what is happening on the ground and what offshore investors can see and learn from their vantage point. This means investors require a higher-return (typically unaffordable) and shorter-tenure investment in lower income countries. This makes it very challenging for lower income countries to access the long-term and well-priced capital needed to finance projects that are essential to economic development, but which are capital intensive, such as infrastructure. Typically, an asset class such as infrastructure is attractive, as investors see it as a low-risk, long-term investment, so require a lower return. The lack of transparency in lower income countries means that this does not generally apply, as investors typically price in macroeconomic and political risk as well as asset risk.

In 2017, GuarantCo forged a strategic partnership between the London Stock Exchange (LSE) and GuarantCo. The partnership sees GuarantCo providing guarantees for local-currency bonds listed in their home countries and sold to local investors, which are then subsequently dual-listed on the LSE's International Securities Market (ISM). The aim of this dual-listing is to use the ISM as a 'shop window' to offer offshore investors greater transparency and price discovery through the opportunity to more easily observe local-currency corporate bonds over a period of time, thereby changing their perception of the risk associated with lower income country investments.

Under the strategic partnership with the LSE, GuarantCo has dual-listed five local-currency bonds from lower income countries on the ISM. Since the first listing in 2018, there has been one example of a secondary trade in one of the bonds, with a global investor taking a position, and a number of enquiries from other investors. In the context of global capital markets, these market movements are a proverbial 'drop in the ocean', but such is the nature of a first-mover initiative. This evidence of engagement in the local-currency bonds by offshore investors is, in fact, a promising step towards addressing the foreign-direct-investment conundrum described earlier.

To build on the promise of the LSE partnership, GuarantCo has also formed the GuarantCo Institute, running capacity-building workshops and conferences across Africa and Asia to support transaction originators (such as banks) and investors (such as pension funds), by providing training on capital markets and project finance, as well as developing strategy roadmaps (engaging with regulators and policy-makers), to grow their local capital markets.

In parallel, GuarantCo has developed the Blended Knowledge (**guarantco.com/blendedknowledge**) platform that seeks to blend international technical expertise with local credit expertise to enable the dual-listing of more local-currency bonds on the ISM, thereby building a larger body of evidence to attract offshore investor capital to lower income countries at more affordable rates.

The LSE initiative demonstrates CD's ability to leverage its people, network and risk-management expertise to work with both local and international partners and build capacity. This, in turn, leads to greater transparency on risk and pricing and increased investment opportunities.

Under the strategic partnership with the LSE, GuarantCo has dual-listed five local currency bonds from lower income countries on the ISM

TCX

TCX deepens capital markets by hedging offshore local-currency bonds

The importance of well-developed capital markets for economic growth and development can hardly be overstated. The International Finance Corporation (IFC) states that the 'development of bond markets […] is the most important challenge for further local market development' (IFC, 2017, p.3). Nascent economies have financing needs that require long-term investments at fair conditions. Low- and middle-income countries face funding gaps in sectors that are essential to development, from infrastructure and housing to education and health. Development projects require appropriate financing that is usually too long-term or too risky for commercial banks. Capital markets offer a funding alternative that can complement bank financing.

Local capital markets also provide access to local-currency finance. They give local borrowers an alternative to international financing, which is typically denominated in 'hard' currencies, such as the dollar or euro. Enabling local enterprises and households to access local-currency funding relieves them of the burden of currency risk that comes with borrowing in hard currency.

Developing local capital markets, however, remains challenging and is a gradual process that takes time and requires sound macroeconomic policies and solid legal, policy and institutional frameworks. Undeveloped bond markets can lead to illiquidity, high transaction costs and other inefficiencies. Such inefficiencies make it difficult for companies that want to expand or finance new projects to raise the necessary capital at fair conditions. As a result, many companies from emerging and frontier markets in the past have opted to turn to international markets for funding, issuing their local currency-denominated bonds in offshore markets.

While relying on international markets is not a substitute for having well-developed local markets, it may be a feasible option for the foreseeable future, especially for the poorer and more fragile countries (IFC, 2017). Indeed, there are a variety of potential motivations for issuing bonds offshore, ranging from a larger investor base that offers more liquidity to regulatory benefits and price arbitrage opportunities.

Since 2013, TCX has been working increasingly with shareholders, banks and other parties on the issuance of bonds and notes denominated in or linked to local currencies. By creating the market 'sell side' and generating private-investor interest, TCX is supporting the development of capital markets in frontier currencies. Although TCX does not issue these bonds itself, its role is crucial, as it hedges the local-currency payment obligations (coupon and principal payments) stemming from these bonds with the issuing institution, usually one of its DFI shareholders.

These bond issues increase the depth and efficiency of capital markets in frontier currencies and have a signalling effect for financial institutions onshore. Pricing offshore bonds based on local rates provides risk and price transparency, which is crucial for onshore market development.

Since 2013, TCX has supported more than 100 new bond issues with a combined value of more than USD 1 billion in currencies as diverse as the Armenian dram, Costa Rican colón, Dominican peso, Georgian lari, Honduran lempira, Kyrgyzstani som, Myanmar kyat, Pakistani rupee, Sri Lankan rupee, Tajikistani somoni, Tanzanian shilling, Ukrainian hryvnia and West African CFA franc.[4]

TCX has supported more than 100 new bond issues with a combined value of more than USD 1 billion

4. Case study developed by Amadeus Bringmann, Analyst at TCX.

frontclear
A financial markets development company

Frontclear supports financial stability through more inclusive money markets

In frontier markets, money markets are often shallow and illiquid. These markets are essential to a financial institution's capacity to manage funds efficiently and mitigate risks. They are core to a central bank, in that liquid money markets transmit monetary policy and generate a reference rate for further market pricing. Poorly functioning money markets lead to inefficiency, resulting in higher costs of bank lending and encouraging banks to 'hoard' capital and liquidity as an alternative means of managing liquidity and credit risk. The resultant market fragmentation adds risk to the overall financial system.

Frontclear unlocks access to global and local interbank markets for emerging-market and developing-country financial institutions by providing credit guarantees to cover counterparty credit and related risks. Frontclear complements its risk-bearing capacity with the provision of technical assistance to remove barriers to money-market development. Technical assistance is focused on regulatory and legal reform, industry training and financial-market infrastructure development – all targeting the development of liquid global and local money markets.

Ghana – In 2015, Frontclear identified Ghana as a potential market for transactions with cash collateral. However, several challenges were apparent. Notably, the legal framework for repurchase agreements for short-term borrowing in government securities (repos) was lacking, as was transparency on rules and pricing. Classic repos were not possible while they appeared to be executable in buy-/sell-back form, and whether repos could be contracted was unclear.

Market practice in Ghana was limited, making it difficult to agree on a bond's nominal value versus a mark-to-market practice. Market practitioners raised concerns about the lack of price transparency and the liquidity of secondary markets. There was also a lack of understanding on how to mark valuations to market. This meant that the bond books were not real values and that the market was not Basel II compliant.

In addition, almost all buy-/sell-back transactions were 'gentleman's agreements' not covered by any official documentation, such as the Global Master Repurchase Agreement (GMRA). The local banks were keen to understand GMRA documentation, to be on the same level as the international bank subsidiaries operating in Ghana.

Frontclear has guaranteed USD 761 million, mobilising USD 1,420 million

To improve the legal framework for repos and make documentation more understandable, Frontclear developed a comprehensive technical assistance programme in Ghana, which focused on money-market knowledge and awareness, to mitigate legal and regulatory issues and address settlement concerns. The ultimate objective was to open up the repo market for the benefit of the capital-markets development agenda.

Bank of Ghana Governor Ernest Addison said, 'it's early days, but the signals are there. Since Frontclear's advisory and support to the development and launch of the Ghanaian Repo Market Guidelines, the Bank of Ghana has been approached by many global capital-market investors and by local banks alike … all expressing an interest to conduct repo transactions under the global GMRA standard. Frontclear with SocGen and Fidelity Ghana were the first to do so in December 2019, but we see this as just the start to a more liquid interbank market. Frontclear's commitment to Ghana's repo market reforms dates back to 2016, encompassing training, regulatory advisory and transactions' (Frontclear, 2019).[5]

5. Case study supported by Ingrid Hagen, Vice President, Strategic Projects at Frontclear.

Appendix

The academic evidence base

Financial-sector development and economic growth

Inclusive economic growth, defined as growth in gross domestic product (GDP) combined with poverty alleviation (Rodrik, 2007; McMillan et al., 2017), depends on the financial system to mobilise investment resources for private-sector development, infrastructure and human-capital development (such as education and healthcare).

There is broad academic evidence to support the close and causative relationship between financial-sector development[6] and such economic growth, and that it has this effect by driving more efficient resource allocation and lower cost of capital (see, for example, Stiglitz and Weiss, 1981; Gelb, 1989; World Bank, 1989; Roubini and Sala-i-Martin, 1991; King and Levine, 1993; Levine et al., 2000; Levine, 2005).

This relationship is particularly strong for low- and middle-income countries,[7] with increased financial development not only driving economic growth but also accelerating poverty alleviation and reductions in income inequality (Rioja and Valev, 2004a; 2004b; Aghion et al., 2005; Beck et al., 2007).

There are intermediating factors in this relationship, the most important of which are well-functioning institutions – including financial intermediaries, markets and regulators – and transparent credit, market and price information (see, for example, Stiglitz and Weiss, 1981; Arestis and Demetriades, 1997; Acemoglu and Johnson, 2005; Rodrik, 2007; Honohan and Beck, 2007; Lin and Xu, 2012; Andrianova et al., 2015; UNCTAD, 2019).

Because of its importance to inclusive economic growth, finance is often the 'binding constraint' on economic growth in developing countries. Problems include the quantity of finance – especially for low-income countries – but also its cost, tenure and liquidity. These factors suppress investment – leading to constrained growth (Hausmann et al., 2005; Rodrik, 2007; Beck et al., 2011; ODI et al., 2015).

6. Financial development is defined as a combination of depth (measured by the size and liquidity of markets), access (the ability of individuals and companies to access financial services) and efficiency (the ability of institutions to provide financial services at low cost with sustainable revenues, and the level of activity of capital markets). It can be observed in the increasing number, scale and diversity of financial institutions, including banks, insurance companies, mutual funds and pension funds, and in financial markets, such as FX, stock and bond markets, increasing liquidity and turnover, and number of 'market makers' (Sahay et al., 2015; Svirydzenka, 2016).
7. Recent evidence suggests that there is an optimal level of finance for an economy at a given stage of its development – in other words, there can be too much finance as well as too little – and that the positive effects of financial development on growth start to decline and turn negative at higher levels of financial development. However, as most developing countries' financial development remains well below the relevant turning point, this is not particularly pertinent to this discussion (Arcand et al., 2015).

Financial access and poverty

Finance also interacts directly with poverty. Poor households suffer from risk and uncertainty because their incomes are both low and volatile due to their reliance on informal employment and subsistence agriculture. Improved financial access – including those as part of financial development – add to positive coping mechanisms and household resilience and, hence, to poverty alleviation. These effects are also differentially positive for women, as financial access provides them with economic opportunities, especially when accompanied by financial literacy and business training, that they otherwise would not be able to access (Demirgüç-Kunt et al., 2017).

However, the effects of financial access vary by product. Savings products have the strongest link to poverty alleviation, as they can be used to smooth consumption and manage shocks, such as the loss of employment or a breadwinner, thus increasing household resilience. Payment services also have a positive relationship to poverty alleviation, as they lower costs and increase the speed and security of payments (Collins et al., 2009; Armendáriz and Morduch, 2010; Demirgüç-Kunt et al., 2017).

However, the effects of credit on poverty are, at best, mixed. The majority of studies have found that credit has little or no significant impact on income (including from business creation) or on other positive outcomes, such as education, health or women's empowerment. Moreover, it can be associated with unsustainable indebtedness in poor households (Collins et al., 2009; Demirgüç-Kunt et al., 2017).

In addition, the relationship of poverty and the use of insurance products has not been fully researched. Findings to date suggest that agricultural and weather insurance can boost the adoption of higher-productivity farming methods, but there is significant variation when it comes welfare gains in this regard (Demirgüç-Kunt et al., 2017). Furthermore, over the long term, access to financial services of all types has limited effects on asset accumulation – a key aspect of household resilience.

Banking systems

Banking systems are essential for intermediating savings into lending and providing risk-management channels and payments systems. An efficient and stable banking system is critical to the availability, cost and stability of finance.

In many developing countries, especially low-income countries, banking systems do not always fulfil these basic functions. Lending is low relative to GDP and the majority of borrowers are governments, large corporations and high-net-worth individuals, with limited financial access for the majority of households and smaller firms. Deposit mobilisation is low relative to GDP. Regulatory capacity and contract enforcement can be weak. Banking institutions can have excessive liquidity and capital (relative to regulatory standards). Dollarisation of the banking system can also be present and persistent, especially in countries that have suffered from macroeconomic instability (Honohan and Beck, 2011; Griffith-Jones and Gottschalk, 2016; Tyson, unpublished working paper).

Recent developments include the widespread adoption of mobile banking platforms and the emergence, in sub-Saharan Africa and Asia, of regional banking institutions. There have been gradual improvements in regulation and convergence on international banking standards, including Basel III.

This has increased financial access and financial stability and created more competition. However, as noted, greater financial access is not strongly associated with poverty alleviation and, despite increased competition, margins on lending have remained stubbornly high (Griffith-Jones and Gottschalk, 2016; Jones et al., 2018; Tyson and Beck, 2018).

This underdevelopment of the banking system means there is insufficient finance for the investment to drive economic growth and it is too expensive (Honohan and Beck, 2011; Griffith-Jones and Gottschalk, 2016; Batiano et al., Forthcoming; Calice and Zhou, 2018).

This cost of lending has also remained stubbornly high, even as competition in banking markets has increased. This is down to liquidity and capital 'hoarding', with individual banks holding excess liquidity and capital relative to regulatory requirements in low-income countries, due to concerns about the inability to access liquidity, if needed, to manage maturity mismatches and meet general funding requirements (Berger and Bouwman, 1995; Demirgüç-Kunt and Huizinge, 1999; Angbazo, 1997; Calice and Zhou, 2018).

Overall, while many developing countries have seen significant growth and a deepening of their banking systems, they continue to provide inadequate support for inclusive economic growth. More needs to be done to ensure their stability.

Interbank and money markets

Interbank markets enable banks to redistribute liquidity among themselves through short-term money-market instruments. They enable banks that are short of cash to balance their positions by borrowing from the central bank (the 'lender of last resort') or on the interbank market. Banks with excess cash can lend it to other banks in the interbank market. Interbank markets are essential for banks to manage funds efficiently, for the transmission of monetary policy and to provide key benchmarks for interest rates (Sarin and Summers, 2016; Green et al., 2016).

Interbank markets operate through a complex network of financial linkages between financial institutions. They operate either through repos, which are a secured form of lending, or on an unsecured basis, making the credit risk of counterparties an essential aspect of interbank markets. Such unsecured lending can also heighten contagion risks in banking systems (Sarin and Summers, 2016; Green et al., 2016).

In developing countries – and, again, particularly in low-income countries – one element of banking-system underdevelopment of particular relevance to our discussion is interbank markets.

This underdevelopment is caused by interbank markets in emerging economies being dominated by unsecured credit lending, meaning counterparty credit risk is high (Frontclear, 2017).[8] This can be even more intense in relatively small banking systems, as there is often a dominant player that acts as a 'hub' for interbank markets, creating even greater credit and contagion risk and lowering liquidity (Calice and Zhou, 2018; Bwire et al., 2019a; 2019b; Bai et al., 2019).

Banks' response to these factors is to increase the margins on lending and to 'hoard' liquidity as an alternative way of managing their balance sheets (Angbazo, 1997; Green et al., 2018; Bwire et al., 2019a; 2019b). This is significant for economic growth, as it increases the cost of lending and, thus, acts as an investment disincentive. In addition, it undermines the effectiveness of monetary policy, because it reduces transmission through interbank markets. This adds another layer of inefficiency to the banking system and to broader macroeconomic management (Green et al., 2018).

Capital markets

Capital markets are markets for trading long-term financial securities, including shares and debt securities (government and corporate bonds and other fixed-income securities). They are composed of primary markets, which facilitate new capital issuance by firms and governments, and secondary markets, which facilitate secondary trading by investors and provide benchmarks for derivative markets.

Capital markets play a critical role in increasing finance for investment and in stimulating economic growth (see, for example, Fisher, 1930; Hirshleifer, 1970; Fama and Miller, 1972; Demirgüç-Kunt, 1992; Caprio and Demirgüç-Kunt, 1998; Levine and Zervos, 1998; Murinde, 2006; UNCTAD, 2016; 2019).

This positive relationship is down to the fact that capital markets mobilise long-term financing and facilitate the efficient allocation of resources. They do this by increasing the intermediation of finance from savers to enterprises, including through long-term fixed-income securities and non-redeemable equity financing and by providing public information on prices and transactions, which supports the pricing of new capital and liquidity in secondary markets (see, for example, Caprio and Demirgüç-Kunt, 1998; Levine and Zervos, 1998; Green, Maggioni and Murinde, 2000; Murinde, 2006).

In many developing countries – notably in Asia – capital markets have been key in mobilising finance for development and offer a particularly attractive option where banking lending is limited to government, major corporations and high-net-worth individuals.

This is particularly important for developing countries with banking systems that struggle to support economic growth (as discussed earlier), as capital markets provide an important alternative source of finance for development at both a scale and cost that could overcome banking-sector deficiencies and provide an alternative source of finance for development.

The Addis Ababa Action Agenda underscores the role of capital markets and calls on governments to design policies to promote sustainability and low-volatility capital markets. It recognises the importance of developing domestic capital markets, particularly long-term bond and insurance markets, and that international investors can play a key role (UNCTAD, 2016; 2019).

However, in today's frontier markets, such as sub-Saharan Africa,[9] capital markets are underdeveloped.[10] The number of listings is low, liquidity is weak[11] and interest from domestic and international investors is limited (Beck et al., 2011; Murinde, 2016). The range and tenure of their securities are also limited, with most being government issuance and short dated (less than a year, for instance) (Beck et al., 2011; Murinde, 2016). These effects have contributed to high costs of issuance and secondary market volatility, adding a further layer of disincentives to issuers and investors (Murinde, 2006; Beck et al., 2011).

A more encouraging recent trend has been the emergence of regional stock markets. These are important because many low-income economies lack the critical mass to sustain a well-developed capital market in isolation. Still, this development remains nascent.

This underdevelopment of capital markets is a major hurdle to mobilising financing for development from domestic and international investors. This is particularly the case for institutional investors, including international ones. These investors are essential to capital-market development, as they are a source of deep and stable demand for new issuance and they support liquidity, depth and stability in secondary markets,[12] as well as the introduction of international best practices (BIS, 2019).

Local institutional investors also offer the potential to increase local-currency financing – and thus reduce financial-stability risks related to 'hard-currency' financing – by being willing to invest in local-currency products, as they want to match long-term assets to their long-term liabilities to customers, which are also local-currency based (Tyson, 2015).

Policy efforts to tackle these problems have included improving regulation and incentives, such as tax breaks. International development partners have offered technical capacity-building to support these efforts. However, to date, most have not been particularly effective (Beck et al., 2011; Murinde, 2016).

8. In 2017, Frontclear published its first global research study, focused on the structure of repo markets. The study reviewed 127 frontier markets, finding that only 24 had established repo markets.

9. Excluding South Africa.
10. As measured by new efficiencies, turnover and secondary market and capitalisation relative to GDP.
11. As measured by trading volumes and margins.
12. Although they can also be associated with market volatility, as we will discuss.

Foreign-exchange markets

Foreign-exchange markets are essential to trade and investment. They enable the management of cross-border capital flows, including those relating to import and export and inward and outward investment, and are essential to the management and reduction of risk for financial intermediaries and end users, including firms and investors.

Functional foreign-exchange markets provide an immediate exchange of currencies, known as 'spot' transactions, and future or 'forward' exchanges (through instruments such as FX forwards and options), which offer the potential for certainty of exchange rates on specific future dates. Just as for other markets, liquidity is an important aspect of well-functioning foreign-exchange markets, including secondary trading and derivatives.

Many developing countries have underdeveloped foreign-exchange markets. Low-income countries may have illiquid foreign-exchange markets and an ability only to provide spot transactions. More developed markets may enable forward transactions, but often suffer from limited maturity and limited liquidity.

This underdevelopment of foreign-exchange markets has significant negative effects on economic growth. Because of the inability to hedge foreign-exchange transactions, there can be significant risk aversion among investors and exporters. For investors, one of the most common responses is simply not to invest – as reflected in the scarcity of finance in many developing economies – or to seek investments where currency risk can be managed.

One way to do this is to denominate investments in hard currency. Public development agencies and the private sector, for example, may denominate loans in hard currency, passing on the currency risk to the borrower. Alternatively, investors may only invest in sectors that have 'natural hedges', such as the extractive sector, where revenues are denominated in hard currency on international markets. Both responses to foreign-exchange market underdevelopment have negative consequences for economic growth because they either pass on the currency risk to domestic borrowers, or limit investment to sectors with little influence on inclusive economic growth (Tyson, 2018).

In particular, passing on foreign-exchange risk to domestic borrowers, including governments and firms, is particular problematic. Known as the 'original sin' of cross-border capital flows, such domestically absorbed foreign-exchange rates have repeatedly been a source of financial instability (as we discuss further in the next section).

Financial-sector stability

Developing countries have experienced repeated financial instability of both domestic and international origin, with damaging consequences for inclusive economic growth.

Financial instability of international origin has arisen from the increased integration of developing countries into the global financial system, accompanied by financial liberalisation. This has resulted in higher levels of pro-cyclical cross-border capital flows to developing economies, and while they can boost investment, volatile and pro-cyclical outflows have caused macroeconomic instability. This is particularly the case for middle-income countries, which are typically more integrated into the global financial system than low-income countries (Rogoff and Reinhart, 2009; Kinderberger, 2005; Ocampo et al., 2010; Boissay et al., 2013; McKinley and Tyson, 2014; Tyson et al., 2014a; 2014b; Ocampo and Griffith-Jones, 2018).

These pro-cyclical cycles in international capital flows are difficult for developing economies to manage; recent financial liberalisation has diminished capital-management tools, they often lack access to foreign-currency swap arrangements and the use of countercyclical monetary policy can be counterproductive.[13] Such issues have prompted developing countries to generate significant levels of 'self-insurance' in the form of accumulated foreign-exchange reserves, which have proved effective in managing pro-cyclical flows, but which carry a significant opportunity cost when official reserves have to be tapped (Ocampo and Griffith-Jones, 2018; IMF, 2015).

Financial instability of this kind is closely related to foreign-exchange risk. Cross-border capital flows can cause domestic currency depreciation. This can be compounded by hard-currency debt in either the public or private sector, as the decline in value of the domestic currency increases the relative value of that debt for the borrower. The resulting decline in the creditworthiness of borrowers can feed back into a financial crisis, creating a 'vicious circle' that deepens the severity of the crisis significantly. This was a major factor, for example, in the 'Third World' debt crisis of the 1980s, the Asian financial crisis of 1997 and the various Latin American crises of the 1990s (where private-sector hard-currency debt had similar effects), as well as in the recent deterioration in debt sustainability in sub-Saharan Africa (where there was excessive sovereign hard-currency debt) (Ocampo et al., 2010; Rancière et al., 2010; Musacchio, 2012; McKinley and Tyson, 2014; Tyson, 2015; Ocampo and Griffith-Jones, 2018).

Financial instability in developing countries also commonly stems from domestic problems. For example, in sub-Saharan Africa, between 1990 and 2009, 57% of countries experienced domestic institutional failures. Such financial fragility is typically caused by surges in non-performing loans related to macroeconomic weaknesses and governance problems (Lunogelo et al., 2009; Mezui et al., 2012; Central Bank of Kenya, 2013; Tyson, 2015; Beck and Tyson, 2018).

However, banks' susceptibility to institutional failure depends on their balance-sheet structures (Minsky, 2008; De Bock and Demyanets, 2012).

The balance sheets of low-income-country banks typically have characteristics that make them less susceptible to institutional failure; their funding is primarily from deposits, they hold high levels of low-risk assets (such as government securities and foreign assets) and their lending to the private sector is concentrated in lower-risk trade, commerce and construction, with an under-representation of lending to higher-risk agriculture and infrastructure. However, although these characteristics reduce the institutional risk, they also result in the binding constraints of finance on economic growth, discussed earlier (Beck et al., 2011; Batiano et al., forthcoming).

As the financial systems of middle-income countries develop, banks' balance-sheet structures start to evolve. Lending portfolios expand and become more sectorally diverse, with maturities being extended. As noted, this is positive for inclusive economic growth. However, developing countries can also suffer from low levels of savings mobilisation (ODI et al., 2015).[14] This means that banks may find it difficult to fund expansion through deposits and, instead, turn to borrowings. Such an increase in leverage makes banks more vulnerable to economic shocks (Adrian and Shin, 2009; Laeven and Valencia, 2012; Toporowski et al., 2013).

This is particularly true for developing-country banks, which often borrow in hard currency from international investors due to a lack of domestic alternatives. This exposes them to currency mismatches on their balance sheets, which, in the absence of liquid foreign-exchange markets, they are unable to hedge. Some banks have reduced this currency mismatch by lending to end users in hard currency. However, although this reduces the currency risk within individual banking institutions, it does not reduce systemic risk and FX exposure; it simply passes it on to the corporate or household sector, and exposes the bank to the creditworthiness of its customers in hard-currency terms. If there is currency depreciation, this can result in a surge in non-performing loans (Adrian and Shin, 2009; Tyson, 2015; Carnegie Consult, 2017; Kedir et al., 2018).

Overall, both the increase in pro-cyclical cross-border capital flows and the increase in exposure to currency mismatches on the balance sheets of financial institutions, firms and households are a significant source of financial fragility for many developing economies.

Because of this, managing foreign-exchange risk is an important focus of both micro- and macroprudential regulation for developing countries, especially since the global financial crisis. Central banks have sought to assess and manage systemic foreign-exchange risk at regulated institutions and in the financial system – most often through limits on gross exposure. However, this has led to macroprudential policies being associated with lower credit growth, lower financial leverage and muted economic growth (Cerutti et al., 2015; Claessens et al., 2013; Lim et al., 2011; Agenor, 2018).

Financial instability is associated with increased poverty. This is partly because of its negative impact on economic growth and partly because most countries, when returning to growth after financial instability, do so at a permanently lower level of GDP per capita (Laeven and Valencia, 2012; Beck and Tyson, 2018).

However, financial instability also has distributional effects. Economic instability affects the incomes of poor households more than wealthier households, because of the greater uncertainty surrounding net income and their lower levels of resilience (Guillaumont Jeanneney and Kpodar, 2011; Demetriades et al., 2017).

Moreover – and of particular interest here – the strongest negative effect of financial crises on the incomes of the poor is associated with currency crises. This highlights the importance of this discussion on how to manage and mitigate foreign-exchange risks for the poorest households in developing economies (Rewilak, 2017; 2018).

13. In boom times, it may be difficult to increase interest rates, as these will attract additional capital. In times of crisis, countries will find it difficult to reduce interest rates to avoid capital flight. Furthermore, large external financing in boom times will be reflected in rising current-account deficits and real exchange-rate appreciation, leading to a sharp adjustment of the external accounts and exchange-rate depreciation in times of crisis (Ocampo and Griffith-Jones, 2018).

14. See ODI et al. (2015) for a fuller discussion of savings mobilisation.

Financial-sector interventions and impact assessment

As discussed, there is solid academic evidence to support a strong and causative relationship from financial development to economic growth. However, interventions to promote financial development have delivered mixed results.

There have been different types of intervention. These have included directed credit programmes, such as the establishment of regional and national development banks to direct lending to sectors that are important for inclusive growth and which are otherwise underfunded by the private sector, such as agriculture or manufacturing. However, such development banks have been plagued by ineffectiveness and political interference, which has undermined their impact.

Interventions to boost financial access have seen better results. They include public financing of micro-finance programmes, either directly or through intermediaries, such as private micro-finance institutions. They have had significant success in expanding financial access, including to low-income households, and have supported the development of mobile banking. However, as mentioned, the relationship between financial access and poverty alleviation is mixed, especially when it comes to credit, and has little or no effect on broader economic development.

The reasons for these weaknesses in impact are a matter for debate. They could include the poor design and execution of interventions, failure to take sufficient account of informal finance, or the masking of heterogeneous outcomes by averaging (Ogden, 2019).

There is also gathering evidence that the main effects of such interventions are indirect. Known as 'general equilibrium effects', these include indirect employment creation, rising wages in casual labour markets and pro-poor changes in the price of commodities (known more formally as 'spill-over effects on nontreated participants') (Field et al., 2013; Breza et al., 2018; Muralidharan et al., 2020; Ogden, 2019).

In recent years, an alternative approach has emerged from these direct credit programmes – market-building intervention. This of particular relevance to our discussion, because much of CD's work relates to financial market-building.

Capturing both direct effects and systemic and spill-over effects is of particular importance to such programmes, as they may have much more powerful effects than those from directed credit programmes or than direct effects. However, to date, the methodology to do so remains in development.

References

Acemoglu, D. and Johnson, S. (2005) 'Unbundling Institutions'. *Journal of Political Economy*, 133(5): 949—994.

https://bit.ly/32Fablh

Adrian, T. and Shin, H.S. (2010) *Liquidity and Leverage*. Staff Report No. 328. Revised November 2010. New York: Federal Reserve Bank of New York.

https://bit.ly/3kpuCZq

Agenor, P.R. (2018) 'Growth and welfare effects of macroprudential regulation'. *Macroeconomic Dynamics*, 23(8):1—23.

Aghion, P., Howitt, P. and Mayer-Foulkes, D. (2005) 'The Effect of Financial Development on Convergence: Theory and Evidence'. *Quarterly Journal of Economics*, 120(1): 173–222.

https://bit.ly/2REQgMI

Andrianova, S., Baltagi, B., Beck, T., Demetriades, P., Fielding, D., Hall, S.G., Koch, S., Lensink, R., Rewilak, J. and Rousseau, P. (2015) *A New International Database on Financial Fragility*. Working Paper No. 15/18. Leicester, UK: University of Leicester, Department of Economics.

https://bit.ly/3iH9PQH

Angbazo, L. (1997) 'Commercial bank net interest margins, default risk, interest-rate risk, and off-balance sheet banking'. *Journal of Banking & Finance*, 21(1): 55—87.

Arcand, J., Berkes, E. and Panizza, U. (2015) 'Too Much Finance?' *Journal of Economic Growth*, 20(2): 105-48.

Armendáriz, B. and Morduch, J. (2010) *The Economics of Microfinance*. Second Edition. Cambridge, MA: MIT Press.

Arestis, P. and Demetriades, P. (1997) 'Financial Development and Economic Growth: Assessing the Evidence'. *The Economic Journal*, 107(442): 783—799.

Bai, Y., P. Weiss, V. Murinde and C. Green (2019) 'Kenya interbank market: a network analysis'. SOAS Centre for Global Finance Conference Paper 12. London: Centre for Global Finance, School of African and Oriental Studies, University of London.

https://bit.ly/33IL5kS

BIS — Bank for International Settlements (2019) *Establishing viable capital markets*. CGFS Papers, No 62. Basel, Switzerland: BIS Committee on the Global Financial System.

https://bit.ly/2FtGHy3

Batiano, A.B., Griffith-Jones, S., Murinde, V., Soumaré, I. and Tyson, J. (forthcoming) 'Capital flows and productivity in Africa: The angel is in the details'. *World Development*.

Beck, T., Demirgüc-Kunt, A. and Levine, R. (2007) 'Finance, inequality and the poor'. *Journal of Economic Growth*, 12(1): 27–49.

Beck, T, Munzele Maimbo, S., Faye, I. and Triki, T. (2011) *Financing Africa: through the crisis and beyond*. Washington, DC: World Bank Publications.

https://bit.ly/2ZLnXRc

Beck, T. and Tyson, J. (2018) *Capital flows and financial-sector development in low-income countries: A synthesis of evidence*. ODI Report. London: Overseas Development Institute.

https://bit.ly/2H4I4Dv

Berger, A. and Bouwman, C. (1995) *Bank Liquidity and Financial Crises*. Elsevier: London.

De Bock, R. and Demyanets, A. (2012) *Bank Asset Quality in Emerging Markets: Determinants and Spillovers*. IMF Working Paper 12/71. Washington, DC: International Monetary Fund.

https://bit.ly/3iAj9pn

Boissay, F., Collard, F. and Smets, F. (2013) *Booms and Systemic Banking Crises*. Working Paper Series 1514, Macroprudential Research Network. Frankfurt, Germany: European Central Bank.

https://bit.ly/3iFbq9r

Bwire, T., Brownbridge, M., Rubatsimbira, D.K. and Tinyinondi, G.A. (2019a) *Institutional environment and the microstructure of the interbank market*. Working Paper No.15/2019. London: School of Oriental and African Studies, University of London.

Bwire, T., Brownbridge, M., Rubatsimbira, D.K. and Tinyinondi, G.A. (2019b) *Do interbank interest rates reflect the financial soundness of borrowing banks?* Working Paper 14/2019. London: School of Oriental and African Studies, University of London.

Calice, P. and Zhou, N. 2018. *Benchmarking costs of financial intermediation around the world*. Policy research working paper No. WPS 8478. Washington, DC: World Bank Group.

https://bit.ly/3iGzTv4

Carnegie Consult (2017) *The development impact of local currency solutions: An evaluation of 10 years CD*. Maarsen, the Netherlands: Carnegie Consult.

https://bit.ly/3cpRLs0

Caprio, G. and Demirgüç-Kunt, A. (1998) *The role of long-term finance: theory and evidence (English)*. Washington, DC: World Bank Group.

https://bit.ly/32GsHd4

Central Bank of Kenya (2013) *Financial Stability Report 2012*. Nairobi: Central Bank of Kenya.

https://bit.ly/3kkt8Q2

Cerutti, E., Claessens, S. and Laeven, L. (2015) *The Use and Effectiveness of Macroprudential Policies: New Evidence*. IMF Working Paper 15/61. Washington, DC: International Monetary Fund.

https://bit.ly/2RzSEEz

Claessens, S., Ghosh, S. and Mihet, R. (2013) 'Macroprudential policies to mitigate financial system vulnerabilities'. *Journal of International Money and Finance*, 39: 153–185.

Claessens, S., Ghosh, S. and Mihet, R. (2013) 'Macroprudential policies to mitigate financial system vulnerabilities'. *Journal of International Money and Finance*, 39: 153–185.

Collins, D., Morduch, J., Rutherford, S. and Ruthven, O. (2009) *Portfolios of the Poor*. Princeton, NJ: Princeton University Press.

Demetriades, P., Rousseau, P. and Rewilak, J. (2017) *Finance, growth and fragility*. Working Paper 17/13. Leicester, UK: School of Business, Economics Division, University of Leicester.

https://bit.ly/32GsyX4

Demirgüç-Kunt, A. and Huizinge, H. (1999) 'Determinants of Commercial Bank Interest Margins and Profitability: Some International Evidence'. *World Bank Economic Review*, 13(2): 379—408.

Demirgüç-Kunt, A., Klapper, L. and Singer, D. (2017) *Financial inclusion and inclusive growth: a review of recent empirical evidence*. Policy Research Working Paper 8040. Washington, DC: World Bank Group.

https://bit.ly/3kwJghH

Frontclear (2017) Frontclear Study 1. Repo: OTC or exchange-traded?

https://bit.ly/2Repevv

Frontclear Impact Report (2019).

https://bit.ly/2Zq6v4F

Green, C.J., Maggioni, P. and Murinde, V. (2000) 'Regulatory lessons for emerging stock markets from a century of evidence on transactions costs and share price volatility in the London Stock Exchange'. *Journal of Banking and Finance*, 24: 577–601.

Green, C., Bai, Y., Murinde, V., Ngoka, K., Maana, I. & Tiriongo, S. (2016) 'Overnight Interbank Markets and the Determination of the Inter- bank Rate: A Selective Survey'. *International Review of Financial Analysis*, 44: 149—161.

Green, C.J., Murinde, V., Bai, Y., Ngoka, K., Maana I. and Tiriongo, S. (2018) 'The Development of Kenya's Overnight Interbank Market' in M. Ndulo and S. Kayizzi-Mugerwa (eds.) *Financing Innovation and Sustainable Development in Africa*. Newcastle upon Tyne, UK: Cambridge Scholars Publishing, pp. 207—234.

Griffith-Jones, S. and Gottschalk, R. (2016) *Achieving Financial Stability and Growth in Africa*. London: Routledge.

Gelb, A.H. (1989) *Financial Policies, Growth and Efficiency*. Policy Planning and Research Working Paper 202. Washington, DC: World Bank.

https://bit.ly/2H4HK7L

Guillaumont Jeanneney, S. and Kpodar, K.R. (2011) Financial Development and Poverty Reduction: Can There Be a Benefit Without Cost? *Journal of Development Studies*, 47(1): 143—163.

Hausmann, R., Rodrik, D. and Velasco, A. (2005) *Growth Diagnostics*. Cambridge, MA: John F. Kennedy School of Government, Harvard University.

https://bit.ly/2FwDVbk

Honohan, P. and Beck, T. (2007) *Making Finance Work For Africa*. Washington, DC: The World Bank.

https://bit.ly/32EyDDI

IFC (2017). *The Importance of Local Capital Markets for Financing Development*. EM Compass, Note 28. Washington, DC.

https://bit.ly/35RHenU

IMF (2015) *Dollarization in Sub-Saharan Africa: Experience and Lessons*. IMF African Department Report. Washington, DC: IMF.

https://bit.ly/32EazQZ

Kinderberger, C. (2005) ***Manias, Panics and Crashes***. Fifth Edition. New York: Palgrave Macmillan.

King, R. and Levine, R. (1993) 'Finance and Growth: Schumpeter might be right' ***Quarterly Journal of Economics***, 108(3): 717—737.

https://bit.ly/33lKcJ4

Jones, E., Beck, T., Knaack, P. (2018) 'Room to Manoeuvre: How Developing Countries Can Tailor Basel Standards'. Policy Brief. Oxford, UK: Global Economic Governance Programme, Blavatnik School of Government, University of Oxford.

https://bit.ly/3molCEu

Laeven, L. and Valencia, F. (2012) ***Systemic banking crises: An update***. IMF Working Paper 12/163. Washington, DC: IMF.

https://bit.ly/3c7MlI3

Levine, R., Loayza, N. and Beck, T. (2000) 'Financial Intermediation and Growth: Causality and Causes' ***Journal Of Monetary Economics***, 46: 31–77.

https://bit.ly/35UDlJK

Levine, R. (2005) 'Finance and Growth: Theory and Evidence' in P. Aaghion and S.N. Durlauf (eds.) ***Handbook of Economic Growth***. Amsterdam, the Netherlands: Elsevier, pp. 865—893.

Lim, C., Columba, F., Costa, A., Kongsamut, P., Otani, A., Saiyid, M., Wezel, T. and Wu, X. (2011) ***Macroprudential Policy: What Instruments and How to Use them? Lessons from Country Experiences***. IMF Working Paper 11/238. Washington, DC: IMF.

https://bit.ly/3c6kRME

Lin, J. and Xu, L.C. (2012) 'Financial Structure and Economic Development' in Lin, J. (ed.) ***New Structural Economics: A Framework for Rethinking Development and Policy***. Washington, DC: World Bank.

https://bit.ly/3mxuvwT

Lunogelo, H., Mbilinyi, A. and Hangi, H. (2009) ***Global Financial Crisis and Tanzania: Effects and Policy Responses***. Final Report. London and Dar es Salaam: ODI and The Economic and Social Research Foundation.

https://bit.ly/2RAd7cr

Mezui, C., Nalletamby, S. and Kamewe, H. (2012) 'African Systemic Financial Crises' ***Africa Economic Brief***, 3(9): 1—4. Abidjan: African Development Bank.

https://bit.ly/3iGmyTI

Minsky, H. (2008) Stablizing an ***Unstable Economy***. New York: McGraw Hill.

Musacchio, A. (2012) ***Mexico's Financial Crisis of 1994-1995***. Harvard Business School Working Paper 12–101. Cambridge, MA: Harvard Business School.

https://bit.ly/2GKpS1X

Muralidharan, K., Niehaus, P. and Sukhtankar, S. (2020) ***General equilibrium effects of (improving) public employment programs: experimental evidence from India***. NBER Working Paper No. 23838. Revised March 2020. Washington, DC: National Bureau of Economic Research.

https://bit.ly/3hFw1JA

Murinde, V. (2016) ***Capital Markets: Roles and Challenges***. Unpublished working draft. Birmingham, UK: University of Birmingham.

Murinde, V., Bai Y., Green C.J., Maana, I., Tiriongo, S. and Ngoka-Kisinguh, K. (2018) ***The peer monitoring role of the interbank market and implications for bank regulation: Evidence from Kenya***. Working Paper Series, No.14/2018. London: Centre for Global Finance, School of African and Oriental Studies, University of London.

https://bit.ly/2FurzR2

McMillan, M., Page, J., Booth, D. and te Velde, D. (2017) ***Supporting economic transformation: An approach paper***. London: ODI.

https://bit.ly/3c8qnyo

McKinley, T. and Tyson, J. (2014) ***Financialization in Developing Countries: Mapping the Issues***. Report for the European Commission's Financialization, Economy, Society and Sustainable Development Programme (FESSUD). Working Paper Series No. 38. Leeds, UK: FESSUD, Leeds University Business School.

https://bit.ly/3muvKwK

Ocampo, J.A., Griffith-Jones, S., Noman A., Ortiz, A., Tyson, J. and Vallejo, J. (2010) ***The Great Recession and The Developing World***. Paper by the Initiative for Policy Dialogue, Columbia University, for the Conference on Development Cooperation in Times of Crisis and on Achieving the MDGs, IFEMA Convention Centre, Madrid, 9-10 June 2010. Madrid: Spanish Presidency of the European Union.

https://bit.ly/3ilHMA8

Ocampo, J. A. and Griffith-Jones, S. (2018) ***Lessons from Emerging Economies for African Low Income countries on Managing Capital Flows***. CGF Working Paper No. 10/2018. London: Centre for Global Finance, School of African and Oriental Studies, University of London.

https://bit.ly/3my9cLk

ODI — Overseas Development Institute, DIE — German Development Institute, ECDPM — European Centre for Development Policy Management (ECDPM), University of Athens (Department of Economics, Division of International Economics and Development) and the Southern Voice Network (2015) ***European Report on Development: Combining finance and policies to implement a transformative post-2015 development agenda***. Brussels: Directorate-General for International Cooperation and Development, European Commission.

https://bit.ly/3mrHT5w

Ogden, T. (2019) ***The Impact of Investing in Financial Systems: Reviewing the Evidence***. London: CDC Group.

https://bit.ly/2SvzJvl

Rancière, R., Tornell, A. and Vamvakidis, A. (2010) 'Currency Mismatch, Systemic Risk and Growth in Emerging Europe'. ***Economic Policy***, 25(64): 597—658.

Rewilak, J. (2017) 'The role of financial development in poverty reduction' ***Review of Development Finance***, 7(2): 169—176.

https://bit.ly/2ZMByI3

Rewilak, J. (2018) 'The Impact of Financial Crises on the Poor' ***Journal of International Development***, 30(1): 3—19.

https://bit.ly/2H0d3k7

Rioja, F. and Valev, N.T. (2004a) 'Finance and the Sources of Growth at Various Stages of Economic Development' ***Economic Inquiry***, 42(1): 127–140.

https://bit.ly/3no1m7A

Rioja, F. and Valev, N.T. (2004b) 'Does One Size Fit All? A Re-examination of the Finance and Growth Relationship' ***Journal of Development Economics***, 74: 429–447.

https://bit.ly/32OxcSR

Rodrik, D. (2007) ***One Economics, Many Recipes***. Princeton NJ: Princeton University Press.

Rogoff, K. and. Reinhart, C. (2009) ***This Time is Different***. Princeton, NJ and Oxford, UK: Princeton University Press.

Roubini, N. and Sala-i-Martin, X. (1991) ***Financial Repression and Economic Growth***. NBER Working Paper 3876. Revised October 1991. Cambridge, MA: National Bureau of Economic Research.

https://bit.ly/3ks1P6E

Sahay, R., Cihak, M., N'Diaye, P.M., Bajaras, A., Ayala Pena, D.B., Bi, R., Gao, Y., Kyobe, A.J., Nguyen, L., Saborowski, C., Svirydzenka, K. and Yousefi, R. (2015) ***Rethinking Financial Deepening: Stability and Growth in Emerging Markets***. Staff Discussion Note 15/08. Washington, DC: IMF.

https://bit.ly/3mvcUFF

Sarin, N. and Summers, L. (2016) 'Understanding bank risk through market measures' ***Brookings Papers on Economic Activity***, 1: 57–109.

https://brook.gs/2RzcBeD

Stiglitz, J.E. and Weiss, A. (1981) 'Credit Rationing in Markets with Imperfect Information' ***The American Economic Review***, 71(3): 393–410.

Svirydzenka, K. (2016) ***Introducing a New Broad-based Index of Financial Development***. IMF Working Paper 16/5. Washington, DC: IMF.

https://bit.ly/2FDiIlI

Toporowski, J., Tyson, J., McKinley, T. and Shabani, M. (2013) ***The Financial System in the UK***. Studies in Financial Systems No. 14. Report for the European Commission's Financialization, Economy, Society and Sustainable Development (FESSUD) programme. London: School of African and Oriental Studies, University of London.

https://bit.ly/3hM6ZIY

Tyson, J., Griffith-Jones, S. and te Velde, D. (2014a) ***Maximising the Impact of International Finance for the Poorest and Most Vulnerable Countries***. ODI Report. London: ODI.

https://bit.ly/3mucyPv

Tyson, J., Griffith-Jones, S. and te Velde, D. (2014b) ***Post-crisis trends in private capital flows to developing countries***. ODI Report. London: ODI.

https://bit.ly/2ZJECom

Tyson, J. (2015) ***The expansion of financial access and financial development in Kenya***. Doctoral thesis. London: School of Oriental and African Studies, University of London.

https://bit.ly/35GQ3kB

Tyson, J. (2017) ***Dollarization in Developing Economies***. London: ODI.

Tyson, J. (2018) ***Private infrastructure financing in developing countries: Five challenges, five solutions***. ODI Report. London: ODI.

https://bit.ly/3iREQRK

Tyson, J. and Beck, T. (2018) ***Capital flows and financial sector development in low-income countries: A synthesis of the evidence***. Growth Research Programme Report. London: ODI.

https://bit.ly/3mwWAEk

UNCTAD — United Nations Conference on Trade and Development (2016) ***The Role of Development Banks in Promoting Growth and Sustainable Development in the South***. Geneva, Switzerland: UNCTAD.

https://bit.ly/2FOQLBy

UNCTAD (2019) ***Trade and Development Report 2019: Financing a Global Green New Deal***. Geneva, Switzerland: UNCTAD.

https://bit.ly/35Qp3zj

World Bank (1989) ***World Development Report: Financial Systems and Development***. Policy and Research Series No. 15. Washington, DC: World Bank.

https://bit.ly/3koTKiY

Acronym's

BIS	Bank for International Settlements
CD	Cardano Development
DFI	Development Financial Institution
DFID	Department for International Development
FESSUD	Financialization, Economy, Society and Sustainable Development Programme
GDP	Gross Domestic Product
GMC	GuarantCo Management Company
GMRA	Global Master Repurchase Agreement
IFC	International Finance Corporation
IFI	International Financial Institution
IMF	International Monetary Fund
ISM	International Securities Market
LSE	London Stock Exchange
NASASA	National Stokvel Association of South Africa
NBER	National Bureau of Economic Research
ODI	Overseas Development Institute
SDG	Sustainable Development Goal
SME	Small and Medium-sized Enterprise
TCX	The Currency Exchange Fund
UNF	United Nations Capital Development Fund
UNECA	United Nations Economic Commission for Africa
UNCTAD	United Nations Commission on Trade and Development
WEF	World Economic Forum

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