Applying Complexity Economics

IFC & World Bank Experience

International Finance Corporation
WORLD BANK GROUP

Creating Markets, Creating Opportunities

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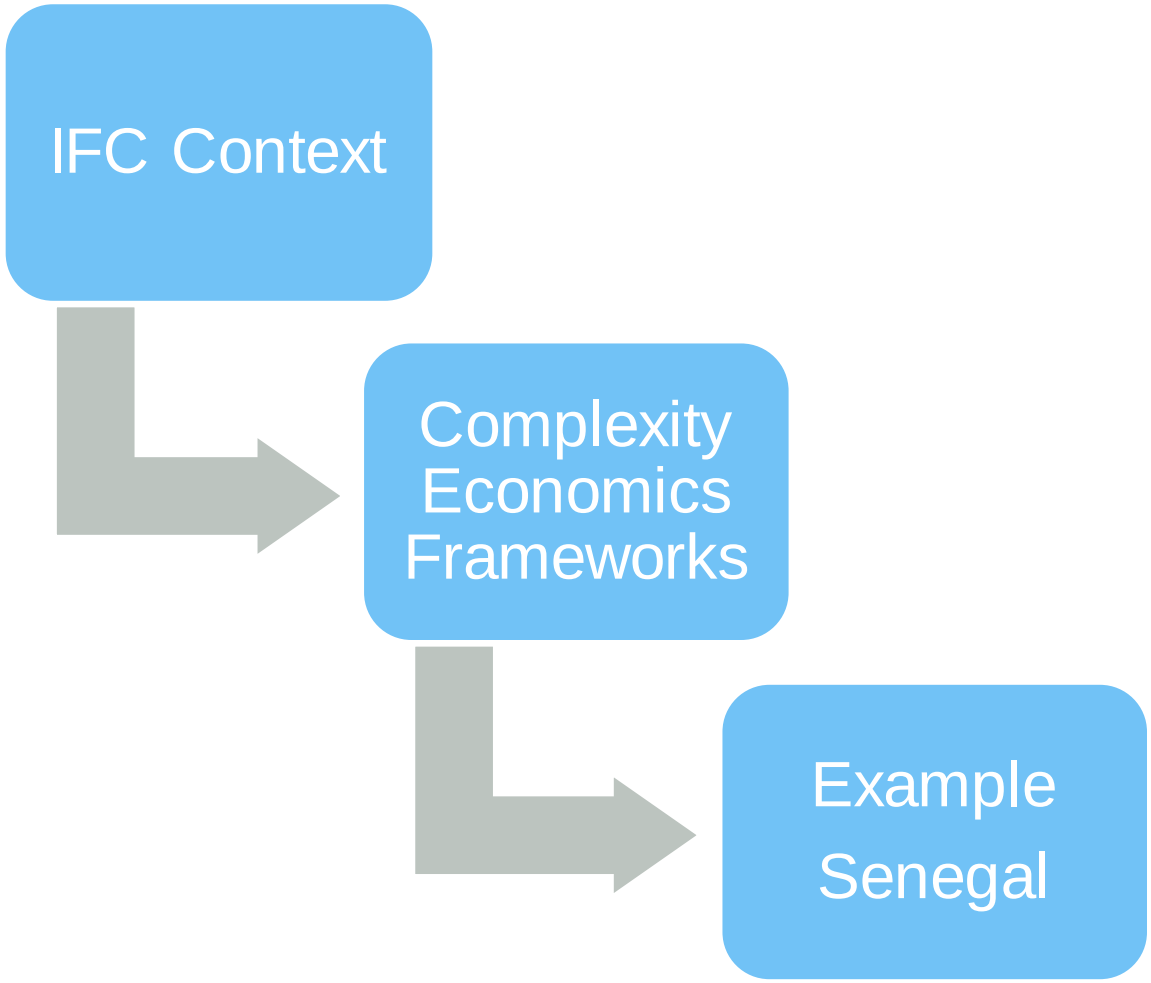
June 19, 2020

European Commission Workshop

Overview


IFC Context
Complexity Economics Frameworks
Example Senegal

IFC: A MEMBER OF THE WORLD BANK GROUP

IBRD	IDA	IFC	MIGA	ICSID
International Bank for Reconstruction and Development	International Development Association	**International Finance Corporation**	Multilateral Investment Guarantee Agency	International Centre for Settlement of Investment Disputes
Loans to middle-income and credit-worthy low-income country governments	Interest-free loans and grants to governments of poorest countries	**Solutions in private sector development**	Guarantees of foreign direct investment's non-commercial risks	Conciliation and arbitration of investment disputes

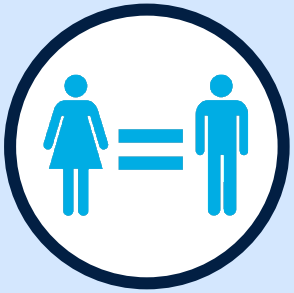
DEVELOPMENT FINANCE TODAY

Major opportunities for mobilizing private capital to:

End Poverty

Boost Shared Prosperity

Tackle Climate Change



Advance Gender Equality

IFC: SIX DECADES OF EXPERIENCE

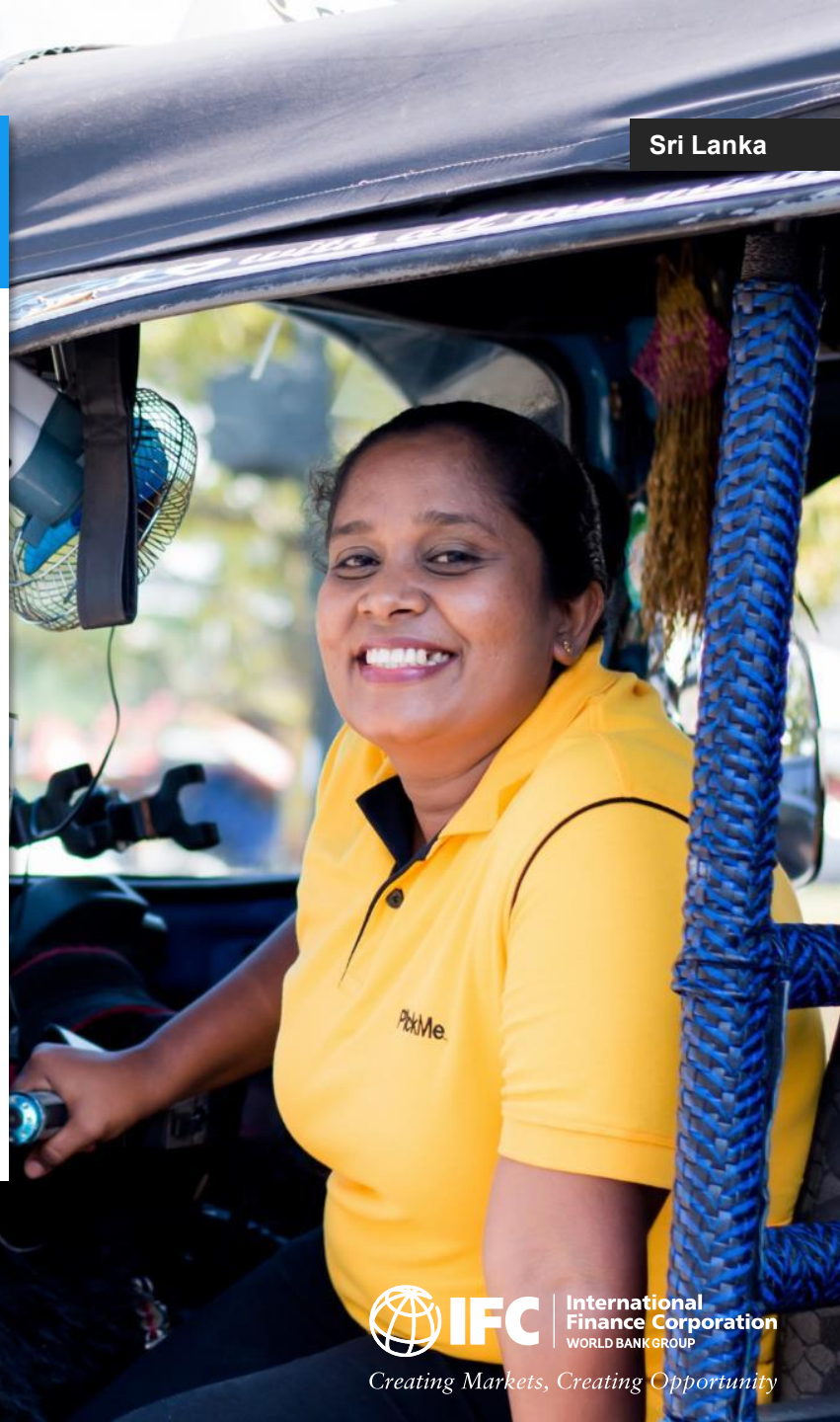
- In mobilizing **private capital** for development
- More than **$285 billion** invested since our founding in 1956
- The world's largest development finance institution focused on the **private sector**
- Leveraging the full range of **World Bank Group** capabilities

Experience Matters.

CREATING MARKETS

A comprehensive approach to tap the power of the private sector by:

- Establishing regulatory and policy frameworks that improve public governance and **enable markets to thrive**
- Promoting **competition and innovation**
- Achieving **demonstration effects** that encourage replication
- Introducing **new solutions** driven by improved technology and logistics
- Building capacity and skills to **open new markets**



Sri Lanka

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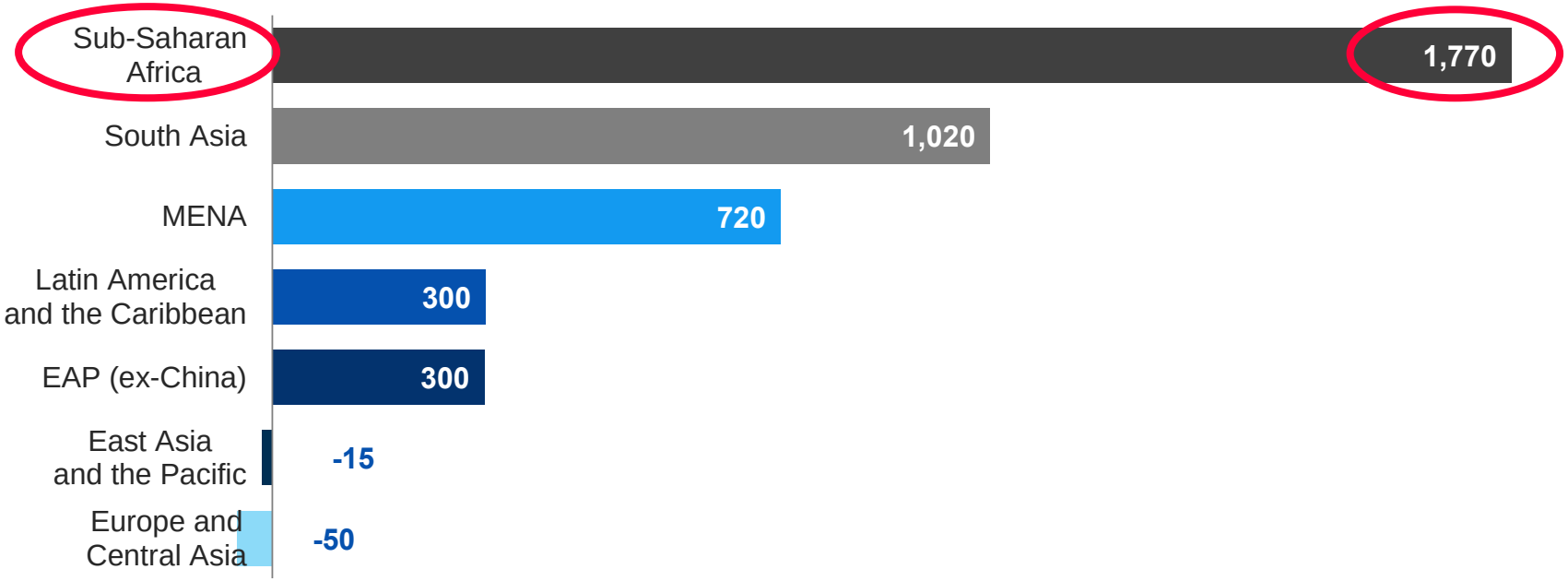
Global Context: Meeting Development Goals in a Challenging Context

More than 3 million new jobs are needed every month in Africa, MENA and South Asia…

Increase in working age population per month
Over the next 15 years, thousands



Source: World Bank and United Nations Population Division's World Population Prospects

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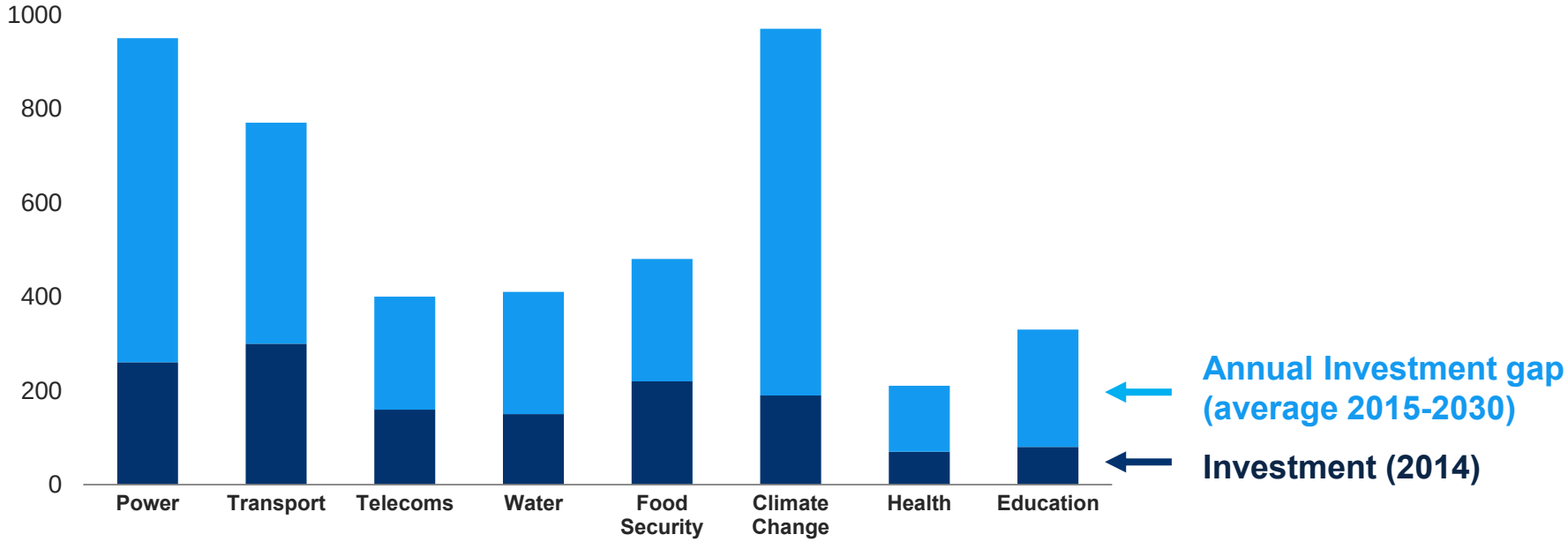
Global Context: Meeting Development Goals in a Challenging Context

$3 trillion per year are needed to reach SDG goals, including …

Investment Gaps in Reaching SDG[1]
In US$ Billion



Source: World Bank Group. 2017. Global Economic Prospects, January 2017

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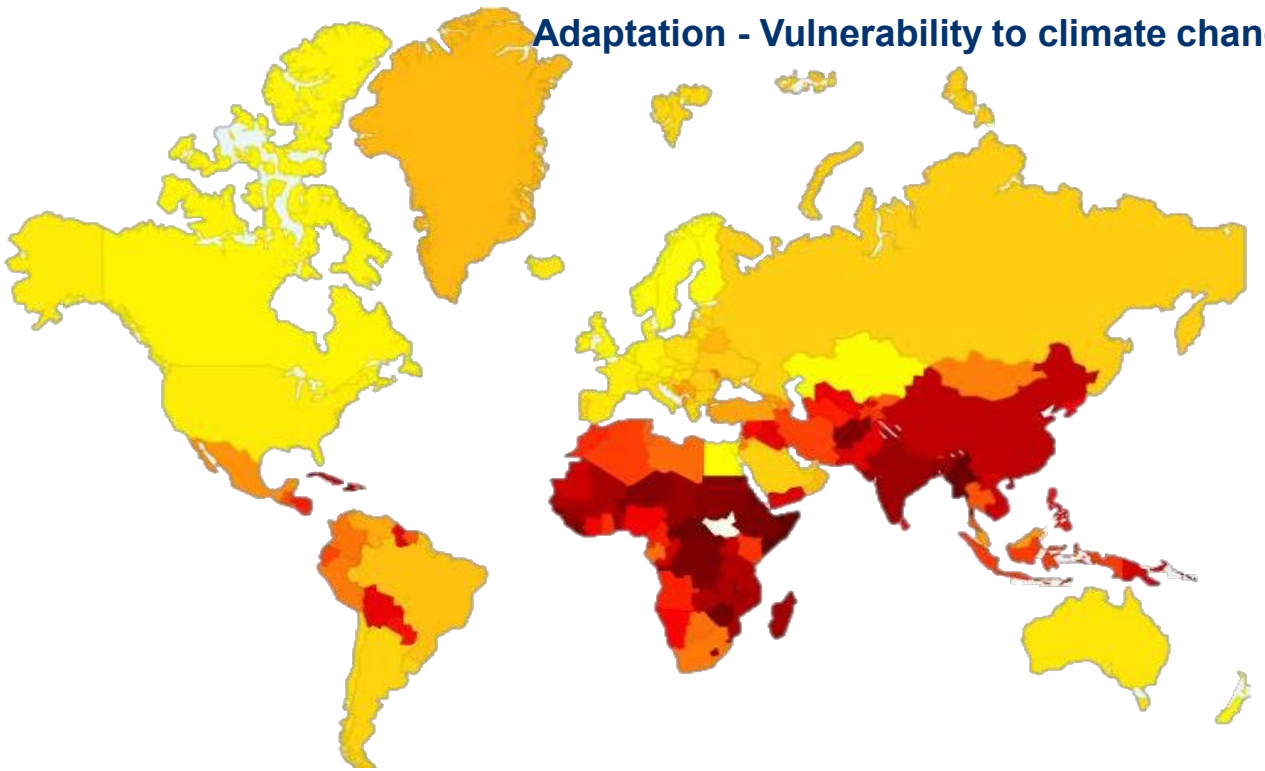
Global Context: Meeting Development Goals in a Challenging Context

Trillions of investments needed to mitigate and adapt to climate change …

MIC and Mitigation

- UMIC emitted 45% of global CO_2 in 2014
- LMIC emitted 12%

Adaptation - Vulnerability to climate change



Rank 1 169

Physical impacts adjusted for coping ability

Source: Center for Global Development, "Quantifying Vulnerability to Climate Change"

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Global Context: Meeting Development Goals in a Challenging Context

Increased fragility and conflicts that are not contained by borders…

More countries experienced violent conflict in 2016 than at any time in nearly 30 years.

65.6 million people forcibly displaced globally.

Fragility threatens to slow – or reverse – recent gains in poverty reduction. If current trends persist, by 2030, more than half of the world's poor will live in countries affected by high levels of violence.

Source: UCDP/PRIO Armed Conflict Dataset - UNHCR Global Trends 2017, as of end-2016 - OECD 2015

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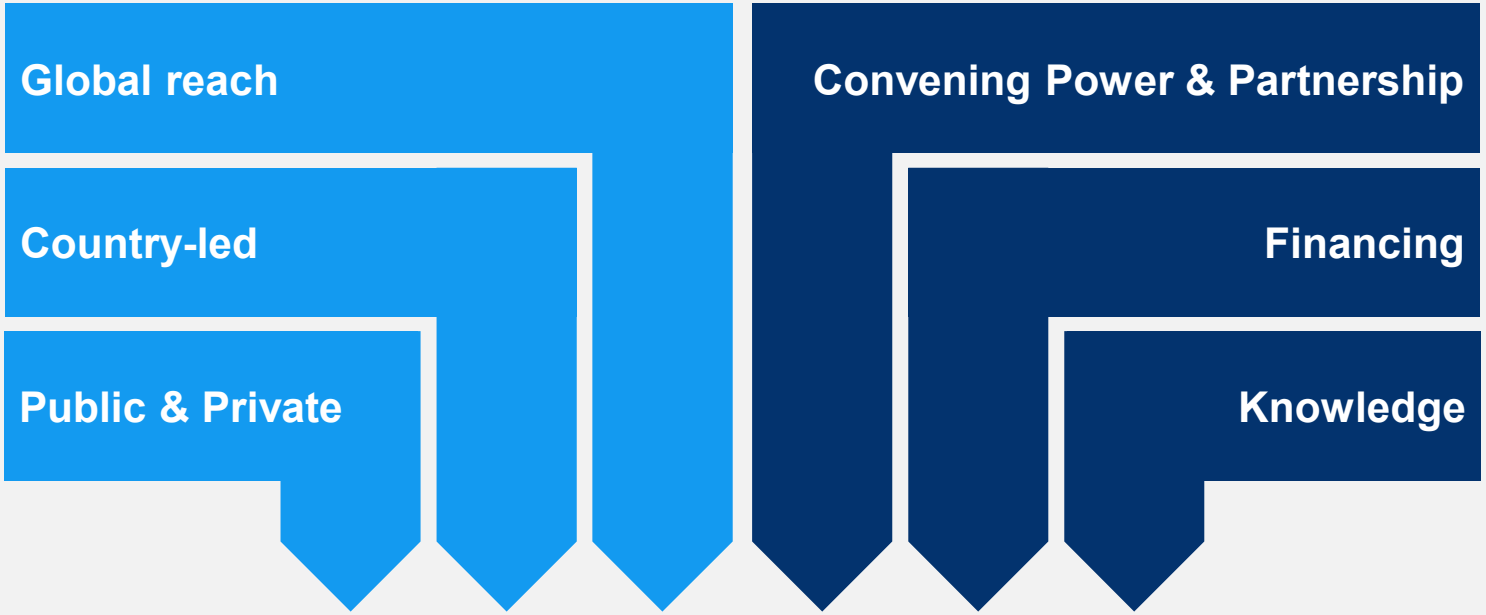
Meeting Development Goals: The World Bank Group's Unique Positioning

The WBG business model …



… maximizes development impact.

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Meeting Development Goals: The World Bank Group's Unique Positioning

The World Bank Group is uniquely positioned to mobilize domestic resources, attract private capital, and create markets.

Use of public sector solutions helps to:

- Establish a supportive investment climate to mobilize private capital for investment in development
- Address market failures & reduce risks.
- Improve domestic resource mobilization, from tax revenues to capital markets
- Enhance public expenditure management

Use of private sector solutions helps to:

- Create jobs in a sustainable manner
- Improve access to services, innovation and technology
- Demonstrate commercial viability of new markets
- Strengthen financial intermediation & expand local capital markets
- Generate tax revenues
- Mobilize third party capital
- Increase competition, set standards & improve sector performance

Both private and public sector arms play an equally important role.

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IFC'S TOOLS AND PLATFORMS

Reducing investment risks in countries, sectors, and projects

Mobilization Platforms

- The **Managed Co-Lending Portfolio Program:** Crowds in billions in private capital from insurance companies and others for IFC projects.
- **IFC Asset Management Company:** Manages billions in assets for investment in IFC projects.

Blended Finance

- Uses small amounts of concessional donor funds to mitigate risks, opening the door to much larger amounts of private investment.
- **IDA 18 IFC-MIGA Private Sector Window:** Mobilizes private investment and contributes to creating markets in the most challenging economic environments.

IFC'S STRATEGY

Maximizing Development Impact, Maintaining Financial Sustainability

IFC'S STRATEGY

Key Focus Areas

FOCUS INDUSTRIES	FOCUS CHALLENGES	FOCUS REGIONS
Infrastructure	Climate Finance	Africa
Agribusiness	Fragility	MENA
Financial Inclusion Health and Education	Digital Economy	South Asia

CROSS CUTTING: **Gender, Disruptive Technology, Developing Local Capital Markets, Scaling up Mobilization**

SUSTAINABILITY

Strong environmental, social, and governance standards are critical to IFC's business growth and development impact

WHAT WE DO

Integrated Solutions, Increased Impact

INVESTMENT

- Loans
- Equity
- Trade and Commodity Finance
- Syndications
- Derivatives and Structured Finance
- Blended Finance

ADVICE

- Innovative Solutions Combining IFC's Expertise and Tools to:
  - Help Create New Markets
  - Unlock Investment Opportunities
  - Strengthen Clients' Performance and Impact
  - Improve Environmental, Social, and Corporate Governance Standards

IFC ASSET MANAGEMENT COMPANY

- Mobilizing and Managing Capital for Investment

INVESTMENT

LOANS	Project and corporate financing On-lending through intermediary institutions
EQUITY	Direct equity investments Private equity funds
TRADE AND COMMODITY FINANCE	Guarantee of trade-related payment obligations of approved financial institutions
SYNDICATIONS	Capital mobilization to serve developmental needs Over 60 co-financiers: banks, funds, DFIs
DERIVATIVES AND STRUCTURED FINANCE	Derivative products to hedge interest rate, currency, or commodity-price exposures of IFC clients
BLENDED FINANCE	Using donor funds to crowd in private financing

ADVICE

TO COMPANIES	Attracting private investors and partners Entering new markets Increasing impact Improving operational performance and sustainability standards Advancing gender equality
TO FINANCIAL INSTITUTIONS AND FUNDS	Strengthening risk management, diversifying product offerings Promoting universal access to finance, strengthening capital markets, and establishing credit bureaus and collateral registries Developing the private equity industry in frontier markets
TO GOVERNMENTS	Structuring public-private partnerships that improve people's access to high-quality infrastructure and basic services Implementing reforms that encourage private investment, spur growth, and create jobs

SUSTAINABILITY

Critical to Client Success, Development Impact

IFC's commitment to **environmental and social sustainability** and **good corporate governance** helps clients:

- **Improve business performance**
- **Protect the environment**
- **Engage with affected communities**
- **Enhance transparency**
- **Increase impact**

SDG LINE OF SIGHT

IFC Articles of Agreement define its mission → ...and imply two Broad Objectives for IFC → ...from which Intermediate Objectives are derived → ...as a means to contribute to SDGs.

IFC ARTICLES OF AGREEMENT (Art. 1)

...further economic development by encouraging the growth of productive private enterprises

...seek to stimulate, and to help create conditions conducive to the flow of private capital, domestic and foreign, into productive investment in member countries

PROJECT OUTCOMES

Implement Investment & Advisory Projects to support private activity that generates impact

Implement projects that generate (positive):

- Economy-wide impact
- Stakeholders impact
- Environmental impact

MARKET CREATION

Implement Investment & Advisory Projects that enable the development of new markets or systemic changes to existing markets

Create markets that can deliver sustainable development impact and therefore are:

- Sustainable
- Inclusive
- Resilient
- Integrated
- Competitive

SECTOR IMPACTS

2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

CROSS-SECTOR IMPACTS

5 GENDER EQUALITY
8 DECENT WORK AND ECONOMIC GROWTH
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
17 PARTNERSHIPS FOR THE GOALS

TWIN GOALS

1 NO POVERTY
10 REDUCED INEQUALITIES

COVID-19 RESPONSE

Supporting Critical Industries

The *Real Sector Crisis Response Facility* will provide $2 billion to support existing clients in the infrastructure, manufacturing, agriculture and services industries vulnerable to the pandemic.

Keeping Trade Flowing

The *Global Trade Finance Program* will provide $2 billion to cover the payment risks of financial institutions so they can provide trade financing to companies that import and export goods.

Helping Clients Pay Their Bills

The *Working Capital Solutions Program* will provide $2 billion in funding to emerging-market banks to extend credit to help businesses shore up their working capital, the pool of funds that firms use to pay their bills and employees' salaries.

Shoring Up Local Banks

The *Global Trade Liquidity Program*, and the *Critical Commodities Finance Program*, will together provide $2 billion in funding and risk-sharing support to local banks so they can continue to finance companies in emerging markets.

COMPLEXITY ECONOMICS AUDIENCES

Policymaker

- Evidence for Policy Design
- Impact Assessment

Strategist

- Sustained Growth
- Feasibility & Unlocking

Client

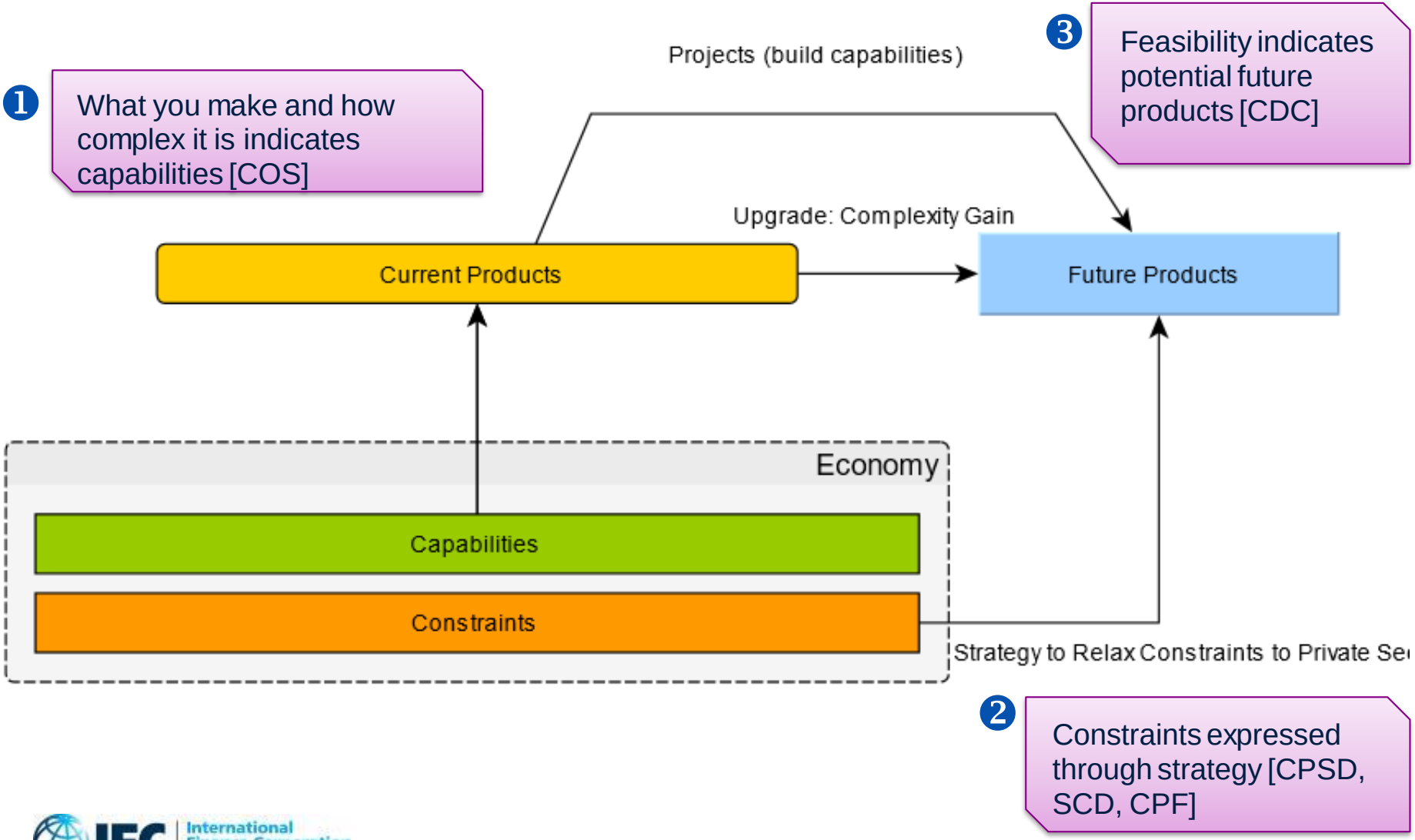
- Expansion Insights
- License

Frameworks

Using Complexity Economics & Fitness (CEF)

Capabilities + Constraints to Opportunities

Analytical Foundation of IFC 3.0 – Creating Markets



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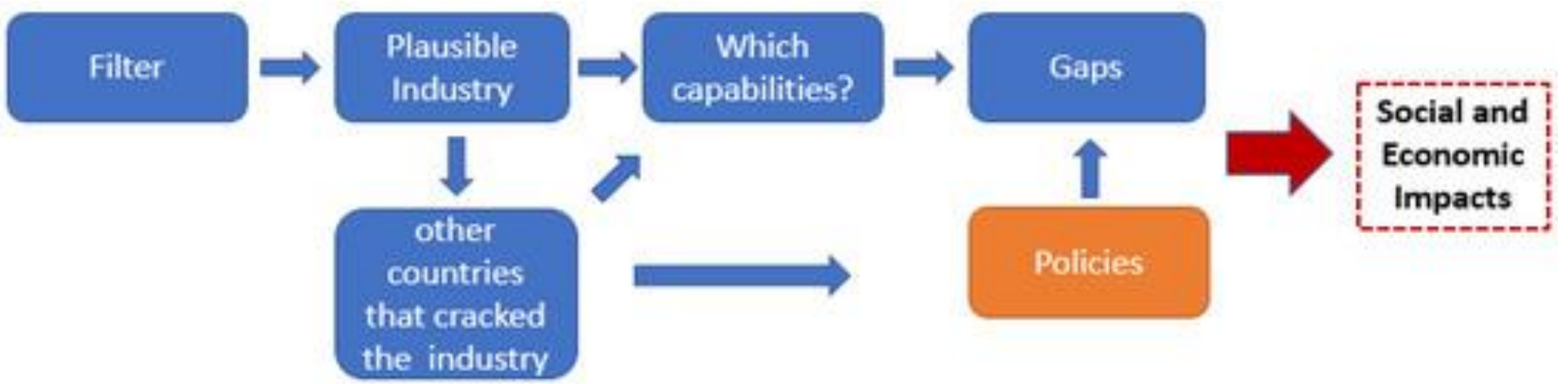
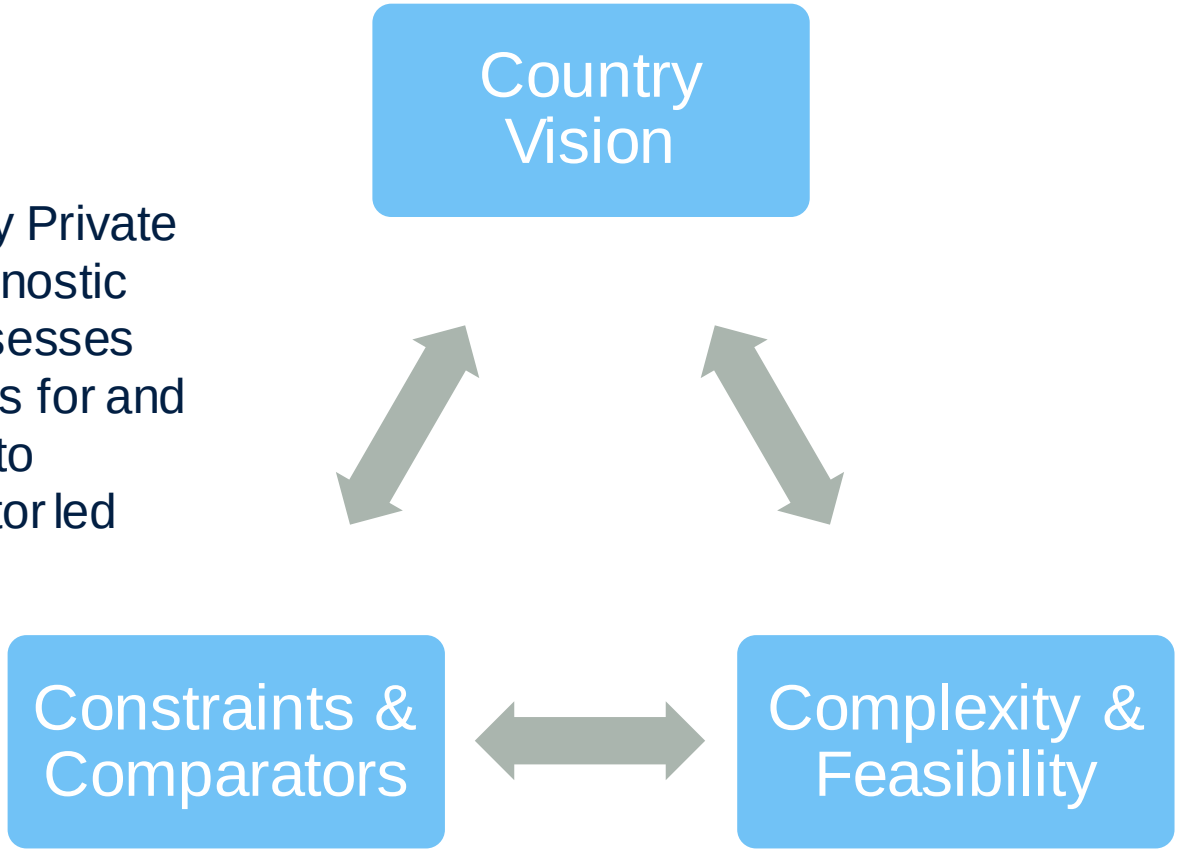
❶ Country Opportunity Spotlight (COS) Logical Framework



❷ CPSD instrument "squares" perspectives

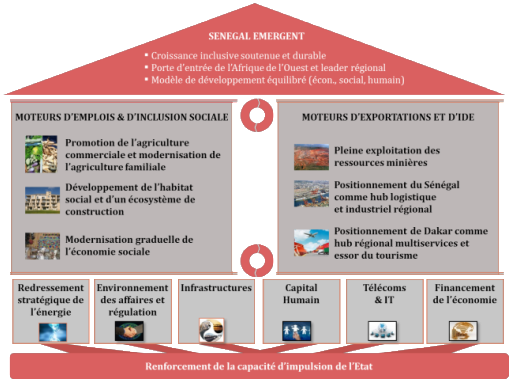
The Country Private Sector Diagnostic (CPSD) assesses opportunities for and constraints to private-sector led growth.



Vision: Emerging Senegal Plan 2016-35 (PSE)

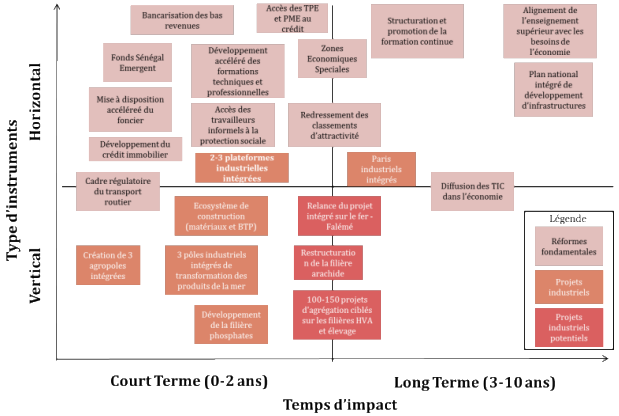
An emerging Senegal in 2035, providing a cohesive society under the rule of law

Approche pour identifier les réformes et projets phare de la stratégie industrielle du Sénégal (Basée sur le PSE)

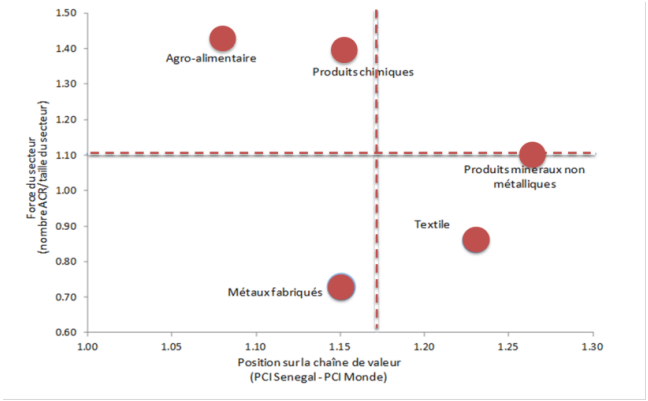


Structural transformation of the economy through the consolidation of current engines of growth and the development of new sectors to create wealth, jobs, and social inclusion, with a strong capacity to export and attract investment.

Quels réformes et projets? (« Comment? »)



Atouts : Quelles priorités sectorielles ? (« Où? »)



*Adopted in 2014, PSE is a three axis or pillar program.

Source: Republic of Côte d'Ivoire (2016), IMF Country Report No. 16/388 (2016), UNECA (2018).

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PSE builds capabilities but competitiveness not yet in top quartile

Senegal maintains competitiveness in key crops and food sectors, but has yet to realize full impact of strategic attention in focus areas

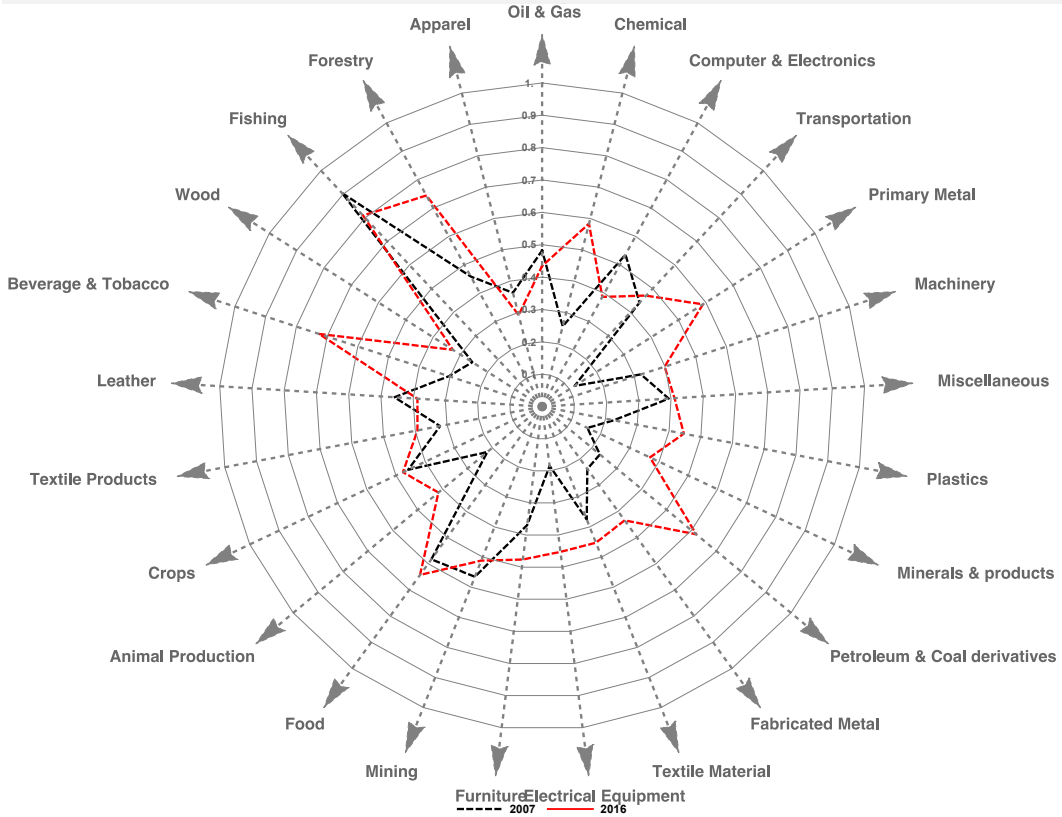
Crops and Food improve slowly

- Since 2007, Senegal lost global competitiveness in oil & gas extraction, leather, and computers & electronics
- Beverages, forestry, petroleum derivatives, and food show improvement to above 50-percentile global competitiveness
- There was widespread improvement in more complex sectors from electrical equipment to primary metals and chemicals but to median levels
- Progress more broad-based than PSE suggested. PSE aims at increasing the productivity of Senegal's economy in strategic sectors (infrastructure, agriculture, mining and tourism), between 2014 and 2018, with an average of 7% growth and aiming at positioning Senegal as an emerging economy by 2035
- The PSE strategy recognizes the agricultural sector as the engine for growth, and provides opportunities for investments to increase food security, increase competitiveness and reduce barriers to stimulate private investment in agriculture, increasing incomes for smallholders/firms and generating employment. There is progress in domestically consumed crops (e.g., rice), but not as much progress in export-oriented crops (eg, tomato).

Sector fitness measures both the level of within-sector diversification and balance of more sophisticated product competitiveness relative to all other countries – top decile (0.9-1) denotes world class and diversified.

Senegal Sector Fitness

2007 and 2016



Source: Tacchella & Cader (2018). IFC Global Macro & Market Research & University of Rome.

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Feasibility benchmarking identifies sector deep dives

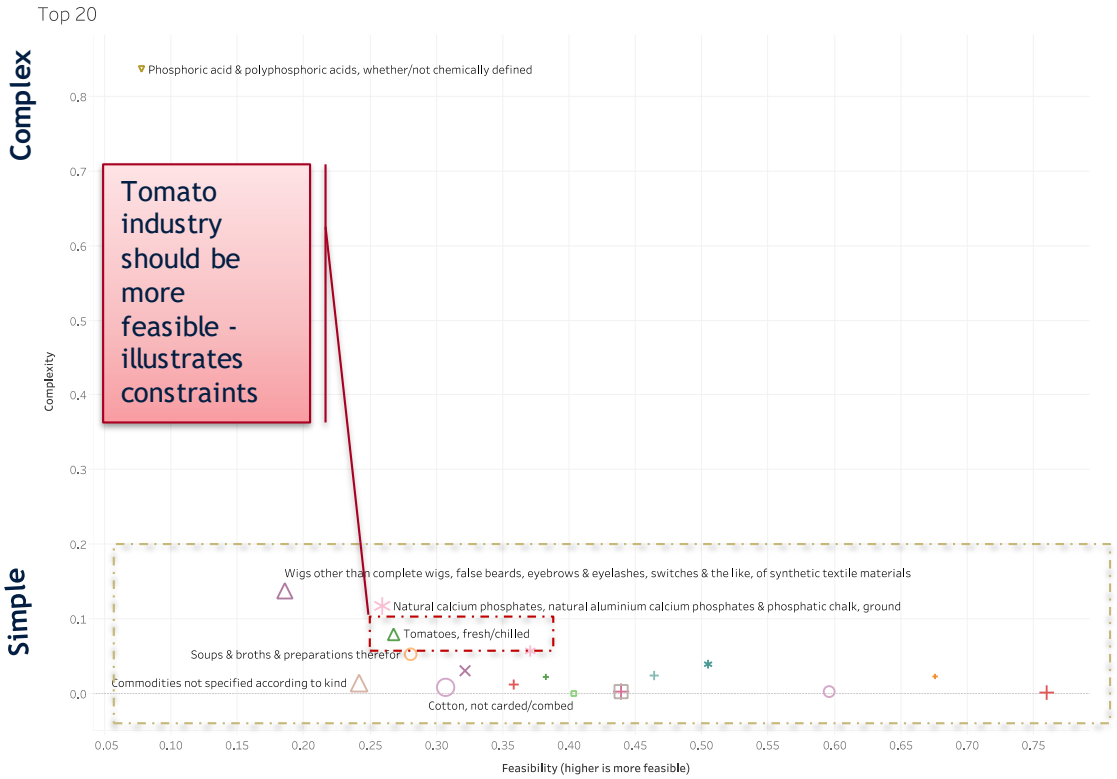
Low complexity goods do not match high labor costs

Simple production dominates

- Only complex product competitively exported is phosphoric acid – the remainder are low complexity
- Low complexity or simple production means that many other low income countries are competitive in the same industries
- The endowments and capabilities needed to compete successfully are available in most countries
- 9 of top 27 industries have a decreasing 5 year growth rate (smaller sized graph symbols)
- CEF pinpoints fresh Tomato - less feasible (0.26) than comparators like Kenya (0.33) – Why?

Highest volume exports are on low-end of complexity spectrum

Senegal top products on Complexity (y-axis) & Feasibility (x-axis), 5 yr export growth (size)



Top product/industry exports (27 categories each over $15 mil) across 11 sectors

Source: IFC

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Tomato sector hit with binding and specific constraints

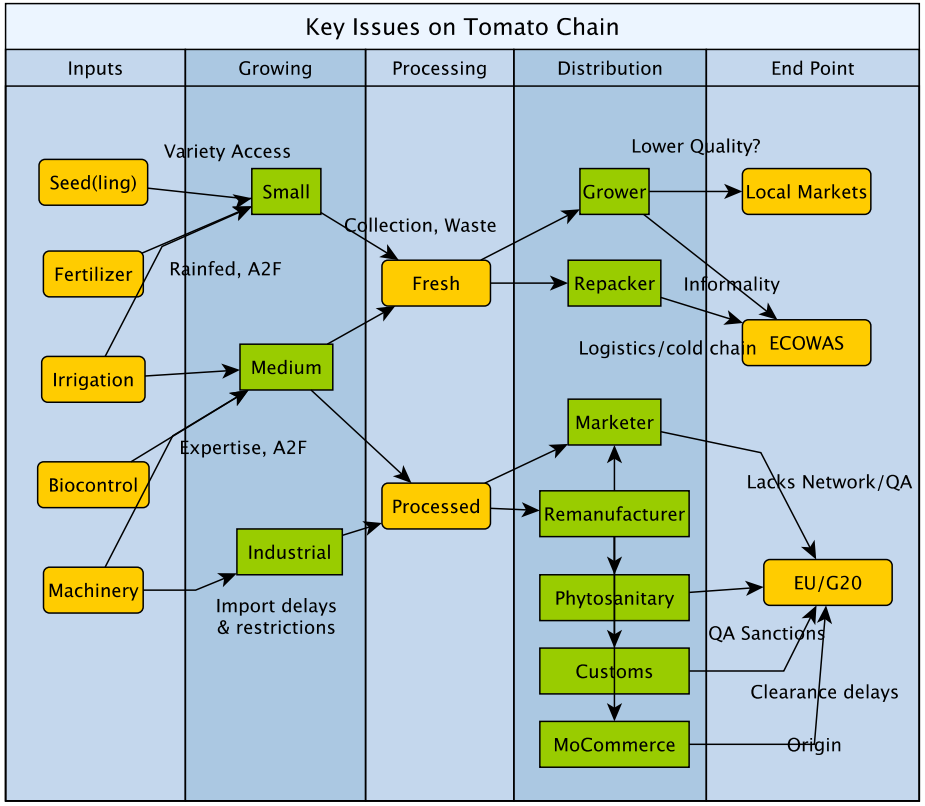
Tomatoes should be more feasible in Senegal, but suffer from a number of economy-wide or binding constraints

Constrained growth

- Tomato post-harvest losses reach about 20 percent of production.
- A third of tomato production is double concentrated and 2,000 to 3,000 tons are dried.
- Imports of triple concentrated tomato reached 10,000 tons, covering 35 percent of the domestic needs.
- More than 1,500 processing companies, only 600 formal.
- Growth diagnostic constraints are infrastructure (logistics), market failures (informality), and micro risks (lack of packaging).
- A Japanese firm will invest in a new tomato-producing area. It becomes economical by expansion into manufacture of tomato-based processed goods in Senegal.
- Access to tomato processing markets nearby is attractive - including Nigeria and Ghana, allowing entry of the Japanese sponsor into ECOWAS.

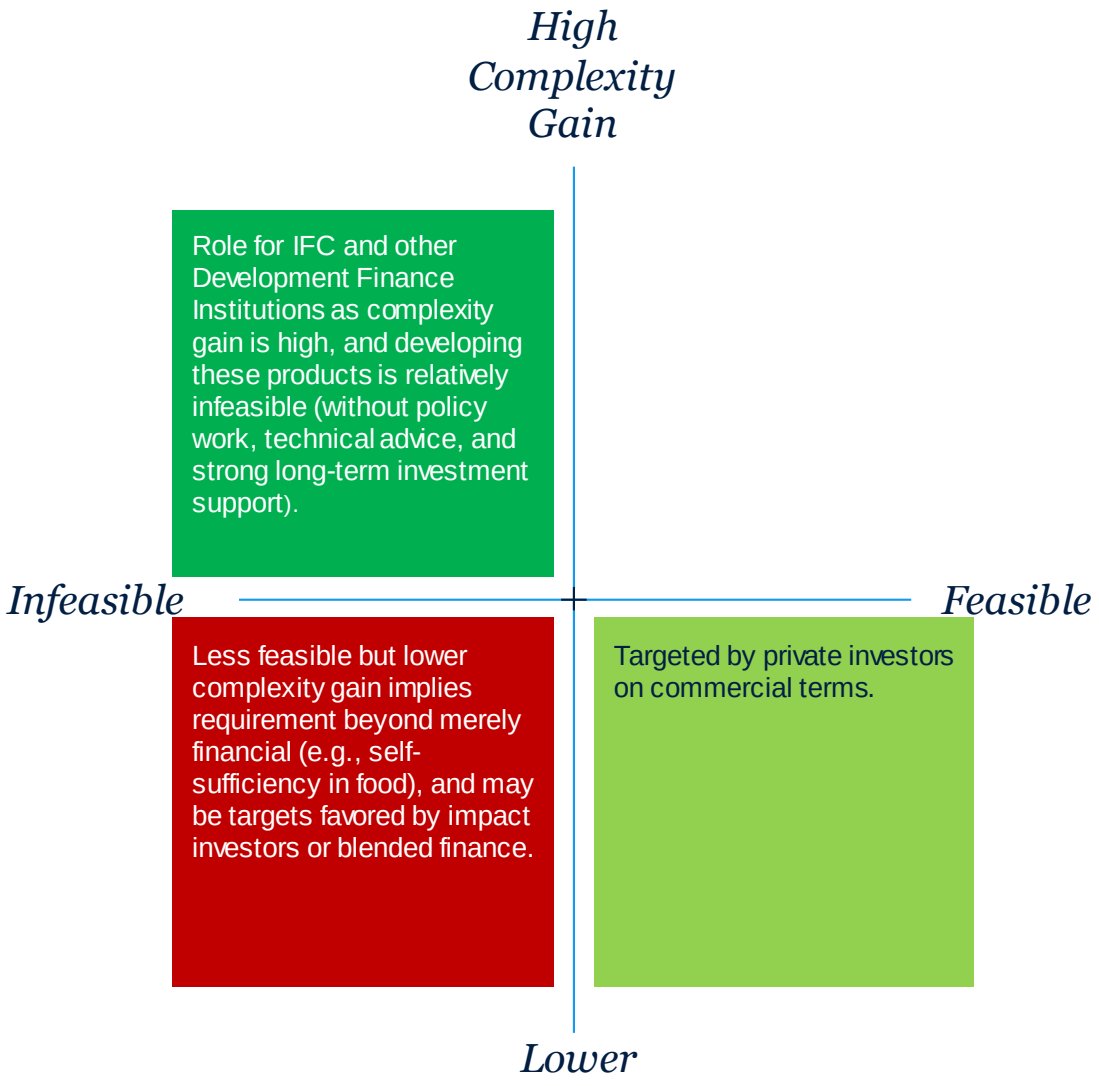
Constraints affect SMEs and Industrials in Horticulture and Processing

Senegal tomato value chain suffers from many constraints



Source: Global Markets & Research, IFC, InfoDev

❸ Complexity Gain or "Unlocking" Decision Framework

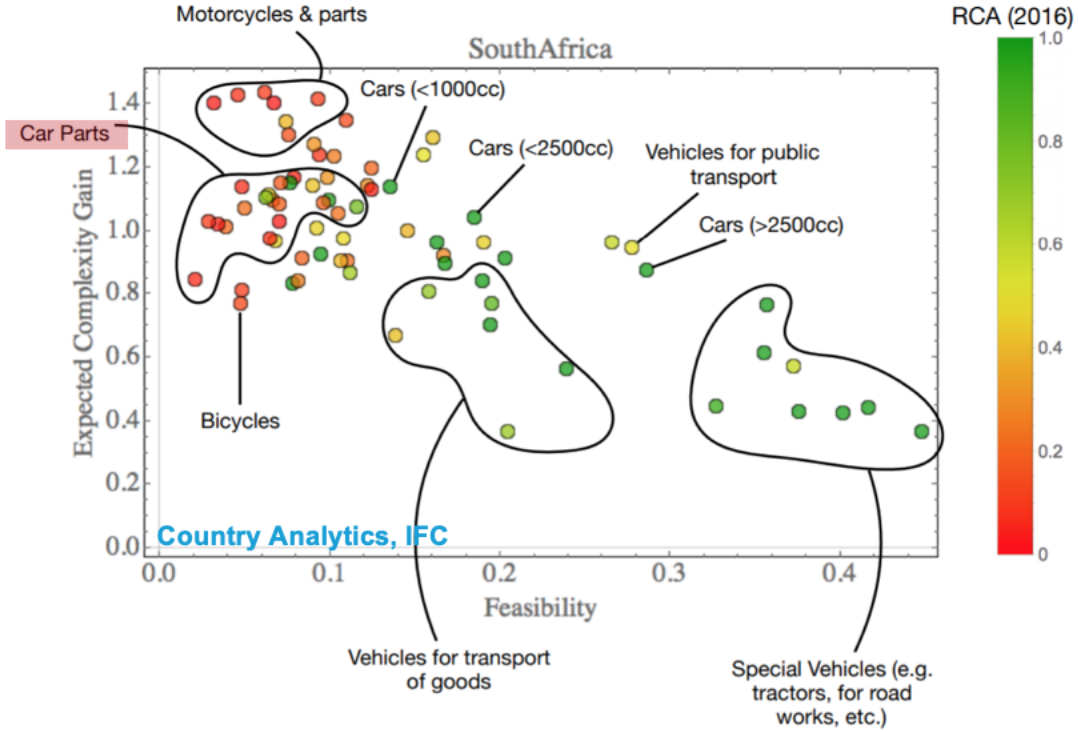


❸ Complexity Gain or "Unlocking" Potential of Sample Project

Within Automotive Sector, Car Parts is quite infeasible in South Africa
Yet a high expected complexity gain…it is likely to unlock many more complex sectors

Project likely to have development impact

- Sponsor target of car parts is expected to create high complexity gain of between 0.8 and 1.2.
- Motorcycle parts is the only product group within sector which has higher complexity gain than car parts. It shares a similar feasibility range.
- South Africa is generally not globally competitive in car parts.



Takeaways

- Used in SCDs, CPFs and CPSDs Strategy Instruments & project Market Creation
- IFC and WB used CDC and COS to…
  - Vision check: Are government focus industries feasible given the available capabilities?
  - Trade-off choices given the Vision goals (country strategy targets for 1.0->3.0)
  - Talking points for engagement with client countries (MoE, MoI)
  - Analytics for client dialogue: What would it take for the private sector to enter an industry which is (in)feasible?
- Two strategy analytical instruments available (COS or Country Opportunity Spotlight and CDC or Country Development Complexity)
- 5-day COS and 15-day full-time equivalent CDC production times

Takeaways – Complexity Economics & Fitness

Economic Fitness

- A measure for economic development that captures a country's level of available endowments and productive knowledge (also known as capabilities)
- **Helps forecast long-term growth and assess a country's competitiveness in different industries**

Product Progression

- Describes the general pathway of countries as they develop new industries, following their process of industrialization
- Assigns a probability over long-term horizons
- **Helps determine feasible opportunities for capability upgrade and diversification**

Product Complexity

- Measures the exclusiveness of different goods and services: industries that require many diverse and non-ubiquitous capabilities are very complex – they are exported competitively by only few countries
- **Helps determine the potential aggregate capability gain as countries develop competitiveness in a new good or service**

APPENDIXES