



# EVALUATING THE IMPACT OF THE COVID CRISIS (IN DATA POOR COUNTRIES)

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# MODELING A CRISIS: THE USUAL PLAYBOOK

1. Identify the relevant transmission channels
2. Collect the necessary (live/HF) data
3. Quantify the shocks
4. Input the assumptions and shocks into a chosen model
5. Analyze and comment the results

## Goal

Quantify and understand the evolution of the crisis in order to ...

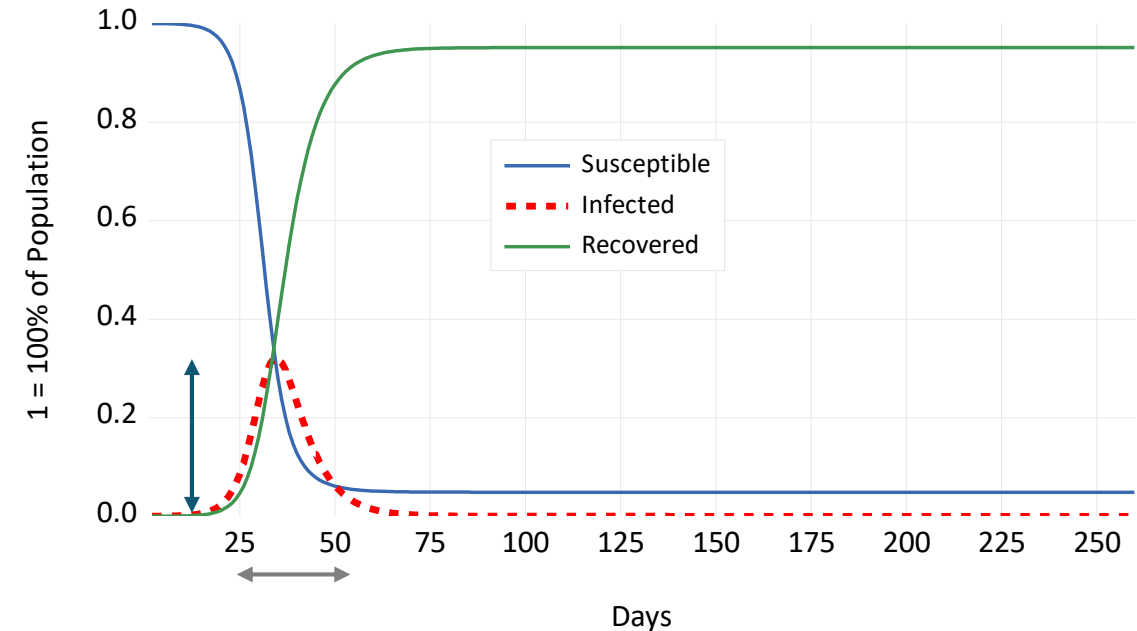
- Help implement and design adequate policy responses
- Identify most vulnerable countries to accelerate, anticipate and target financial assistance



# DIRECT CHANNEL OF THE PANDEMIC

**Health:** If you are sick then it is difficult to be productive, and cannot attend work. Might also result in unfortunate deaths

- Can be modelled using epidemiological models such as the SIR model
- Yet, this is of a second order of magnitude in terms of direct economic impact (at most ~1 000's deaths per million)



Direct impact is thus measured by:

- Duration  $\longleftrightarrow$
- Intensity  $\longleftrightarrow$

# INDIRECT CHANNELS OF THE PANDEMIC

## LOCKDOWNS

**Regulatory closures** have the largest economic effect

- Social distancing, stay-at-home order, unemployment → **lower demand**
- Business closures and restrictions → **reduced supply**
- Border closures and travel restrictions → **reduced trade and tourism**

**Domestic** but highly synchronized → **global impact**

- Capital flight, tighter financial environment, reduced global demand, falling commodities prices, disrupted GVCs

## BEYOND LOCKDOWNS...

**Uncertainty and precaution behaviors**

- Persistent endogenous social distancing even in the absence of formal restrictions
- Reduced consumption and investment due to increased uncertainty (unemployment, future taxes, etc.)

**Fiscal sustainability**

- Increased expenditures, not only healthcare-related, and stimulus measures
- Falling fiscal revenues
- Constrained domestic and external financing environment



# MODELING A CRISIS: THE ~~USUAL~~ MODIFIED PLAYBOOK



Identify the relevant transmission channels



Collect the necessary (live) data



Quantify the shocks



Input the assumptions and shocks into a chosen model



Analyze and comment the results

- **Uncertain behavior and response of economic agents** → definitely not textbook macro
  - How to quantify uncertainty and precautionary motives?
- **Low data availability** → rapid and novel shock
  - Timeframe is in months not to say weeks, requires very high frequency data
  - How to measure home-based activity ? How to measure the differentiated sectoral impact ?
  - What to do in data poor countries ?



# SOLUTION: BE CREATIVE

## OUR APPROACH

Use new sources of data, compare with past experiences, do cross-country analysis

**Low data requirement:** compare to past or current similar cases

**Flexible** to allow simulating a large number of countries in a consistent manner

**Country-specific** to accommodate the specific structure of the economy (tourism-based economy, monoexporter, etc.)

**Largely IO-based** to allow to switch between a sectoral storyline to a global macro view

## “Nowcasting” data available

- Air pollution data
- Google Mobility data
- High-frequency data in developed economies

## Alternative modelling options

- Macrostructural model : MFMOD
- CGE model : ENVISAGE
- Input-Output model

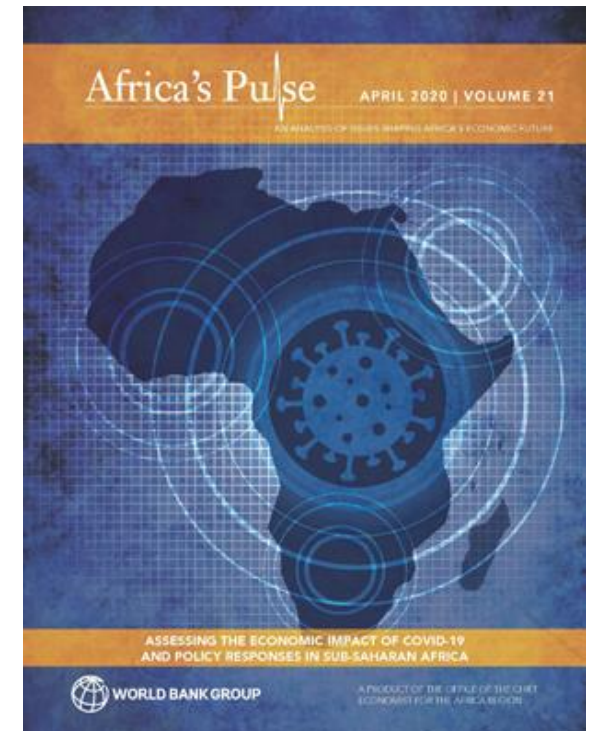
## Comparable past experiences

- SARS
- Ebola



# EXAMPLE 1: ASSESSING THE POVERTY AND MACROECONOMIC IMPACT IN SUB-SAHARAN AFRICA

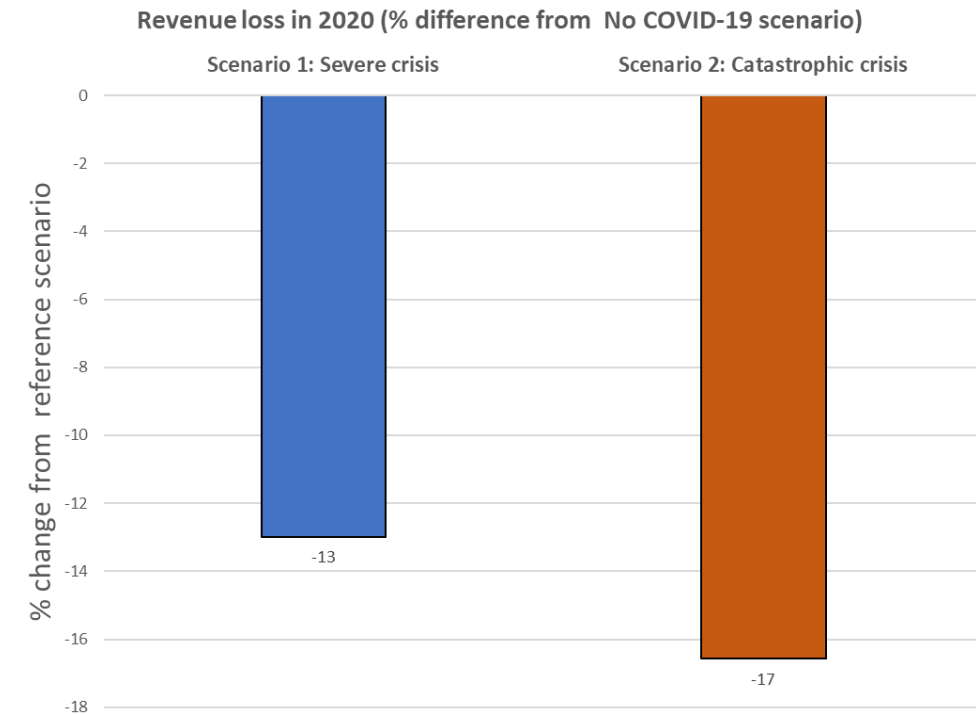
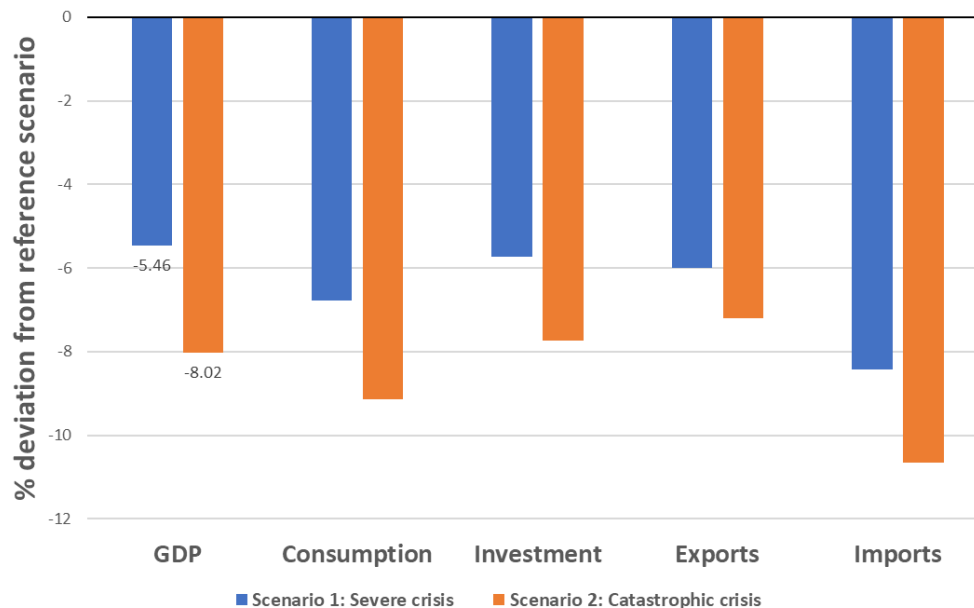
- **Model:** extended version of the CGE model ENVISAGE covering 147 countries, 57 sectors. Input-output tables from the GTAP database
- **Approach:** compare the COVID crisis with past Ebola outbreaks in Guinea (severe case) and in Sierra Leone (catastrophic case), adjusting the intensity depending on preparedness (Epidemic Preparedness Index)
- **Main transmission channels:** labor market participation, labor productivity, trade, FDI, tourism + external global shocks



Africa Pulse Report, No. 21, Spring 2020

# EXAMPLE 1: ASSESSING THE POVERTY AND MACROECONOMIC IMPACT IN SUB-SAHARAN AFRICA

- -5 % to -8 % GDP loss compared to no-COVID scenario
- Public finance crisis: government finances will be hit hard
- Food crisis: food supply decline significantly in most countries





# EXAMPLE 2: FORECASTING THE CRISIS IN SOUTH ASIA

## Sectoral impact of the lockdown in France

Sector	Share in GDP	During lockdown		Two weeks after reopening	
		Loss of activity (in %)	Loss of household consumption (in %)	Loss of activity (in %)	Loss of household consumption (in %)
Agriculture	2	-13	3	-6	8
Manufacturing	14	-38	-33	-24	6
Construction	6	-75	-75	-38	-39
Market services	56	-36	-31	-25	-17
Non-market services (ie. public)	22	-14	-37	-7	-19
<b>Total</b>	<b>100</b>	<b>-33</b>	<b>-32</b>	<b>-21</b>	<b>-6</b>
<i>Of which market</i>	78	-39		-25	
<i>Of which non market (ie. public)</i>	22	-14		-7	
<b>Total, market, excl. rents</b>	<b>65</b>	<b>-46</b>		<b>-30</b>	

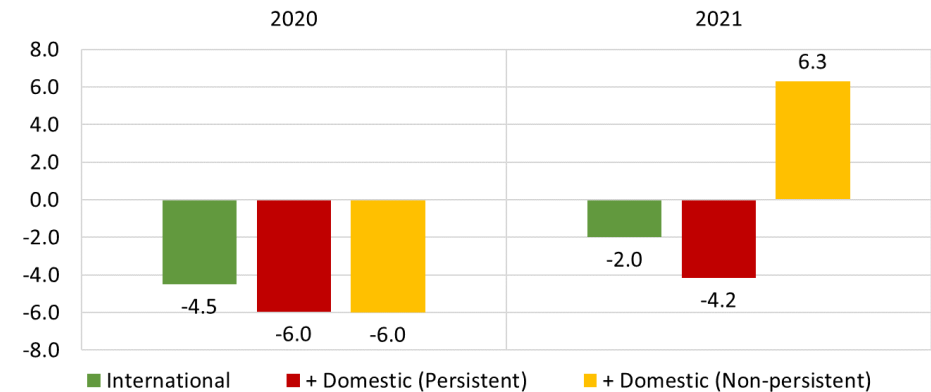
- **Model:** macro-structural model MFMOD estimated for 181 individual countries. Global linked through trade and remittances flows.
- **Approach:** scale the sectoral impact of the lockdown measured in France using mobility data or country expertise. Use I/O tables to split sectoral shocks into final demand shocks
- **Main transmission channels:** lockdown / social distancing + global price and demand shocks

World Bank. 2020. South Asia Economic Focus, Spring 2020 : The Cursed Blessing of Public Banks. Washington, DC: World Bank.

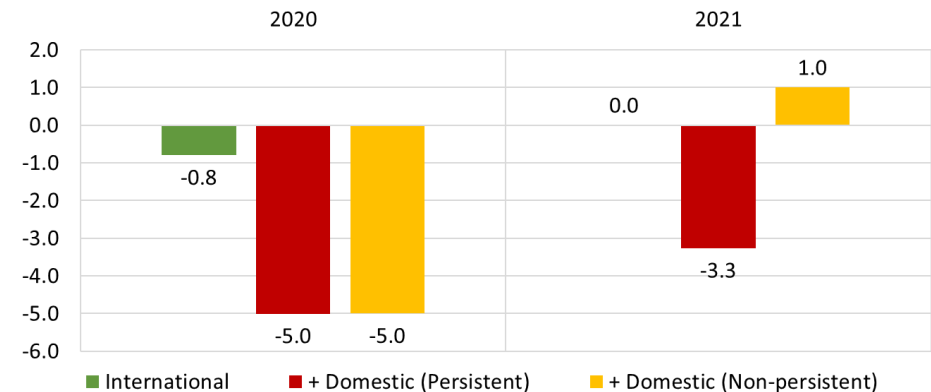
# EXAMPLE 2: FORECASTING THE CRISIS IN SOUTH ASIA

- Bhutan is strongly exposed to the slowdown in the rest of the world (notably India and tourism).
- The impact of lockdown/restriction measures in Pakistan are expected to result in a decrease of 4 pp. in growth in 2020

real GDP (in pp. growth diff. from baseline) - Bhutan



real GDP (in pp. growth diff. from baseline) - Pakistan



**International** = international shocks only

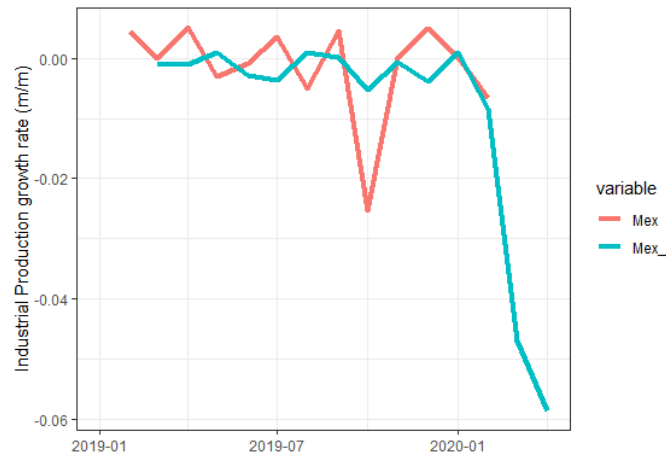
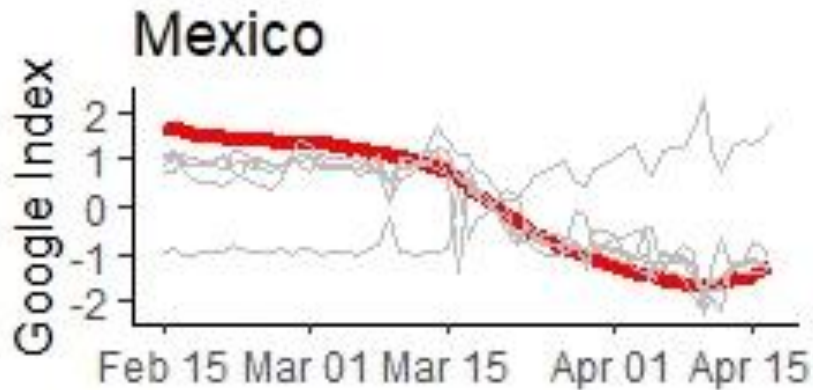
**+ Domestic** = international + lockdown and persistent or non-persistent (social distancing)

# EXAMPLE 3: NOWCASTING ECONOMIC ACTIVITY AND EMPLOYMENT IN MEXICO

Extracting economic leading indicator from Google mobility and air pollution data



Nowcast industrial production



- **Model:** MFMOD, IO model, micro-simulation model
- **Approach:** reverse engineering. Extract now-casting signal from HF data. Decompose the external vs. social distancing shocks in the macro model. Derive poverty and employment results in the micro model.

# MODELS ARE IMPERFECT BUT HELP TO QUANTIFY

- Modelling the impact of the COVID crisis is a challenge due to the particular nature of the shock
- Data limitations (at least for now) add to the challenge
- Yet modelling is relevant and essential for policymakers to avoid playing through the crisis by the ear
  - Allow to (roughly) quantify
  - Help understand transmission channels to better design policy responses
  - Allow to identify the most vulnerable countries