



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 ...

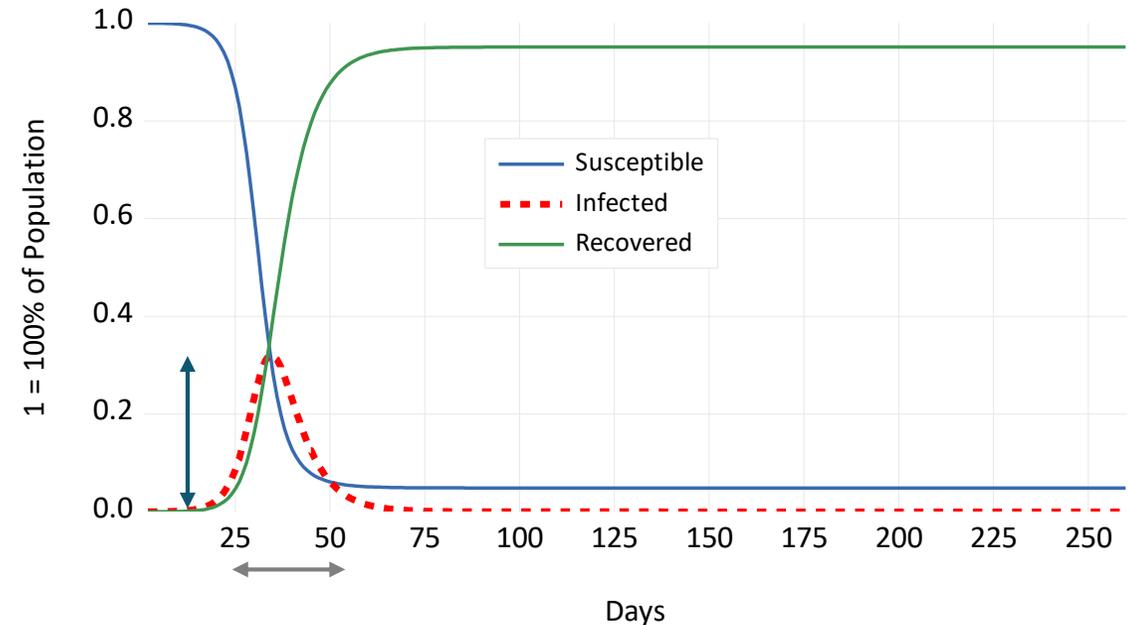
- Help implement and design adequate policy responses
- Identify most vulnerable countries to accelerate, anticipate and target financial assistance



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
- Intensity

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

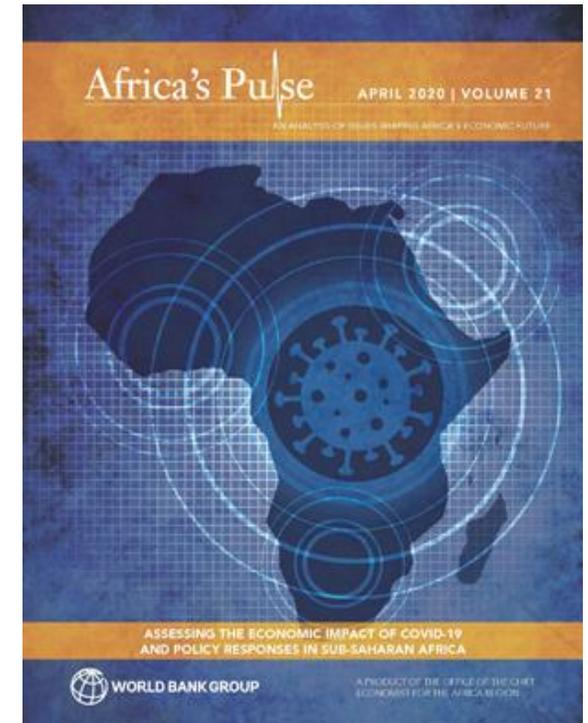
Comparable past experiences

- SARS
- Ebola



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

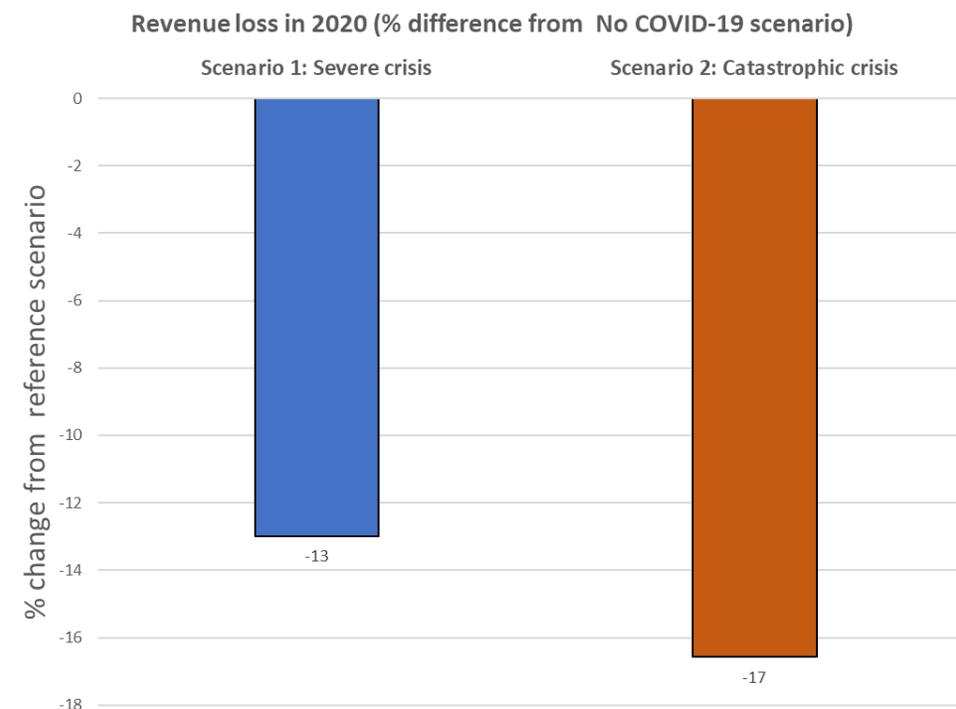
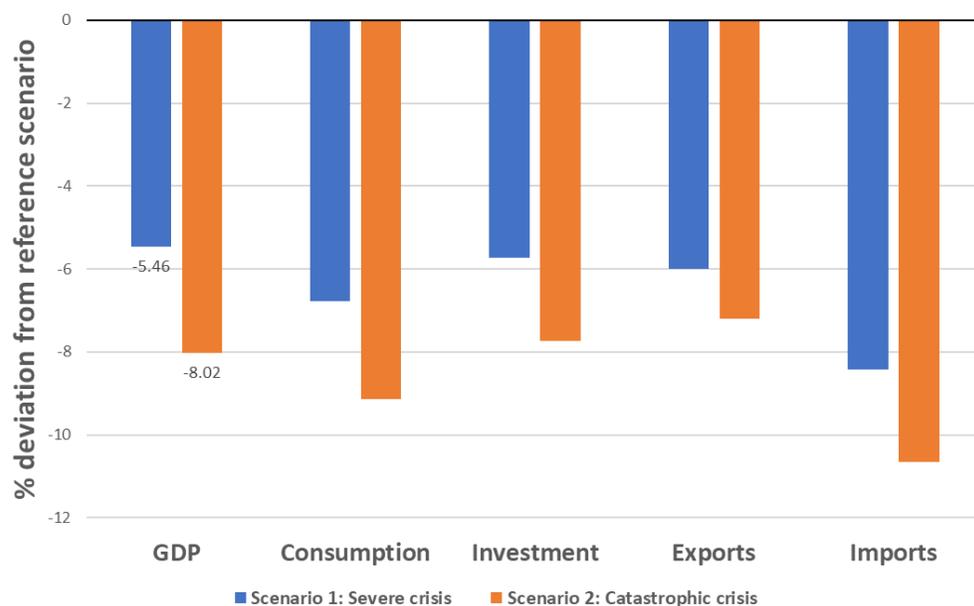
- **Model:** extended version of the CGE model ENVISAGE covering 147 countries, 57 sectors. Input-output tables from the GTAP database
- **Approach:** compare the COVID crisis with past Ebola outbreaks in Guinea (severe case) and in Sierra Leone (catastrophic case), adjusting the intensity depending 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
Total	100	-33	-32	-21	-6
<i>Of which market</i>	78	-39		-25	
<i>Of which non market (ie. public)</i>	22	-14		-7	
Total, market, excl. rents	65	-46		-30	

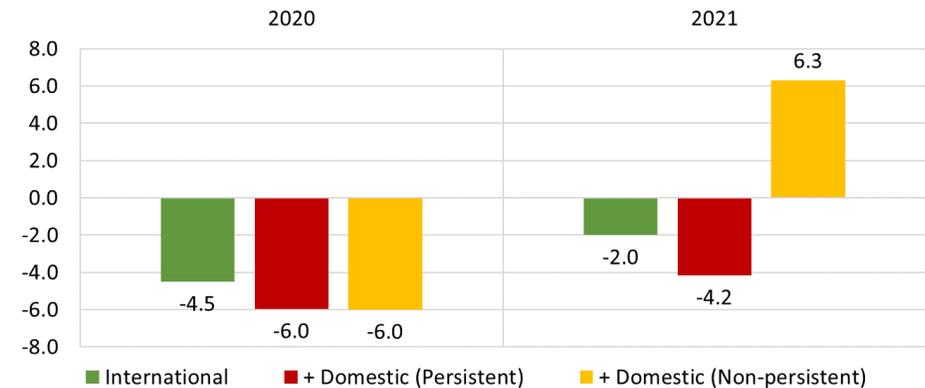
- **Model:** macro-structural model MFMOD estimated for 181 individual countries. Global linked through trade and remittances flows.
- **Approach:** scale the sectoral impact of the lockdown measured in France using mobility data or country expertise. Use I/O tables to split sectoral shocks into final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

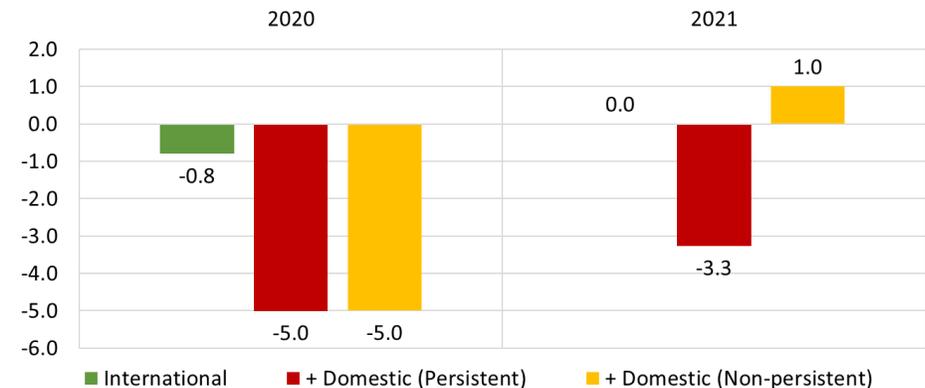
EXAMPLE 2: FORECASTING THE CRISIS IN SOUTH ASIA

- 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

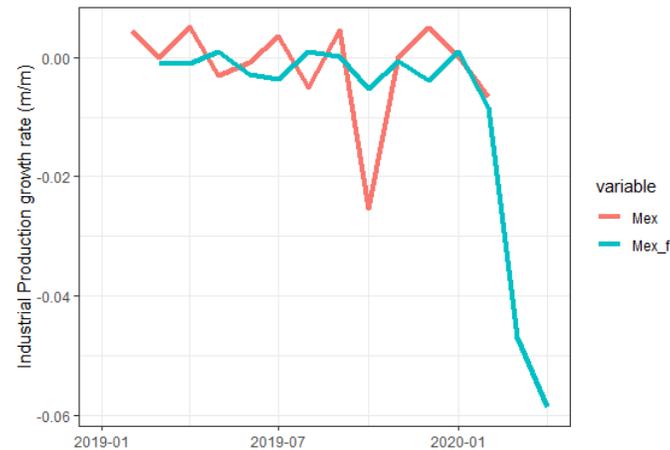
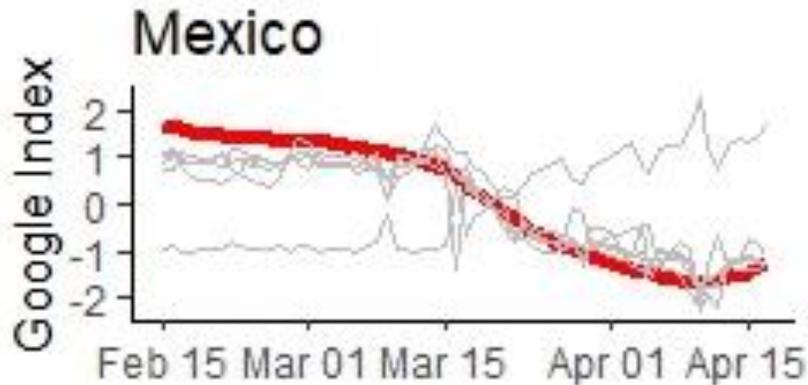
+ Domestic = international + lockdown and persistent or non-persistent (social distancing)

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