Covid-19 and Lockdown Policies: Bottom-Up Recessions in Four Countries

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Covid-19 Pandemic

- Highly infectious, serious illness, 4.3 million global deaths (8/21)
- Policy response: Industry and Household lockdowns
  - Voluntary (motivated by fear or response to infection) or mandated by government
  - Complementary policies: Redundant for many businesses (e.g., restaurants, theaters)
- Led to catastrophic, rapid, fall in demand and production in contact-intensive industries, especially services
  - Rapid fall in employment and incomes in directly affected sectors
- Unprecedented speed and magnitude of the impact
  - Quarterly data understate the result of the shock. Monthly data needed to capture what happened.
  - Comparable to a natural disaster (flood, hurricane) without loss of capital stock

Lockdowns: Bottom-Up Recession

- The household and industry lockdowns caused a “bottom-up” recession
  - Originates in demand/supply crash in many contact-intensive and/or non-essential sectors, with indirect effects on linked sectors supplying intermediate inputs
  - Large shocks to aggregate employment, capacity utilization of capital, and GDP
- The bottom-up recession led to changes in expectations and global markets that generated a “standard” recession that compounded the shock
  - Increased consumer poverty, confidence, and uncertainty: consume less and buy fewer consumer durables (e.g., autos)
  - Investor uncertainty: cut back on real investment (delaying or cancelling construction projects and investment in new plant and equipment)
- Pandemic is global: reduced import demand and export supply globally

Mitigating Economic Impacts of Lockdowns

- Policies to mitigate impact of lockdown/distancing policies
  - Keep labor employed and earning but not working: job retention schemes
  - Keep firms alive but not producing: industry subsidies
  - Income support for laid off/furloughed workers: focus on poverty and low skill labor
  - Safety-net programs for low-income households
- Put the economy in stasis to control the pandemic and support recovery
  - Wide variation across countries in design and effectiveness of mitigation policies

Modelling a Recession

- “Standard” macro models work with economic aggregates and focus on operation of asset and financial markets, with links to the real side through changes in expectations and behavior of economic “actors” (firms, workers, households, investors, government, and world markets) that generate changes in commodity and factor markets
  - Models are very aggregated
- A bottom-up recession starts with changes in household and industry behavior at a very disaggregated level where the pandemic affects behavior (e.g., contact-intensive, essential, and non-essential sectors)
  - Effects then feed up to behavior of macro aggregates

Modelling a Bottom-Up Recession

- Modelling a bottom-up recession needs to work with very disaggregated data on supply and demand for goods and services, since that is level at which the shock operates
- Need to consider complex links across sectors
  - Demand for intermediate inputs by producers causes any shock to demand and production to reverberate across the economy: supply chains
    - E.g., a cut in auto demand affects producers of machinery, metals, plastics, electronics, chemicals, and services
  - The shock is national in scope and impact, and requires economywide as well as sectoral analysis
    - Focus on links across sectors and economic “actors”

Data: Social Accounting Matrix (SAM)

- Social Accounting Matrix (SAM) includes demand/supply of intermediate inputs (input-output table) and national accounts
  - Traces circular flow from production, industry payments to labor/capital, distribution of income to households and government, and back to demand for goods/services
- Data supports “SAM-based” structural models that trace the impact of any change in commodity demand to resulting changes in industry production, employment, wages, and household income
  - Widely used for analysis of natural disasters (e. g., floods, hurricanes)
- Two families of SAM-based models
  - SAM-multiplier models
  - Computable General Equilibrium (CGE) models: Single-country and Multi-country

SAM-Based Models

- SAM-multiplier models are being used widely to analyze lockdown scenarios
  - Four country comparison: South Africa, Mexico, UK, US
  - Other models at IFPRI for developing countries
- Computable General Equilibrium (CGE) models that simulate market economies with substitution possibilities in production and demand.
  - Adjustment works through changes in prices and wages operating smoothly in commodity and factor markets. Models are nonlinear.
  - Designed to consider adjustment to shocks that work through market mechanisms
  - CGE models relevant for recovery phase and post-crisis economic environment

Scenario Analysis with SAM-Multiplier Model

- Specify the lockdown shocks on a monthly basis in four countries: US, UK, Mexico, South Africa
  - March: limited household and industry lockdown effects, no induced macro shocks. The shock only hit in the last half of the month.
  - April: Full household and industry lockdown effects and induced macro shocks on investment and exports. Worst month for US, UK, South Africa.
  - May: Worst month for Mexico. For other countries, partial opening, loosening of both household and industry lockdowns, modest gains in aggregate investment and exports.
  - June: Further opening and loosening of both household and industry lockdowns, further modest improvement in aggregate investment.

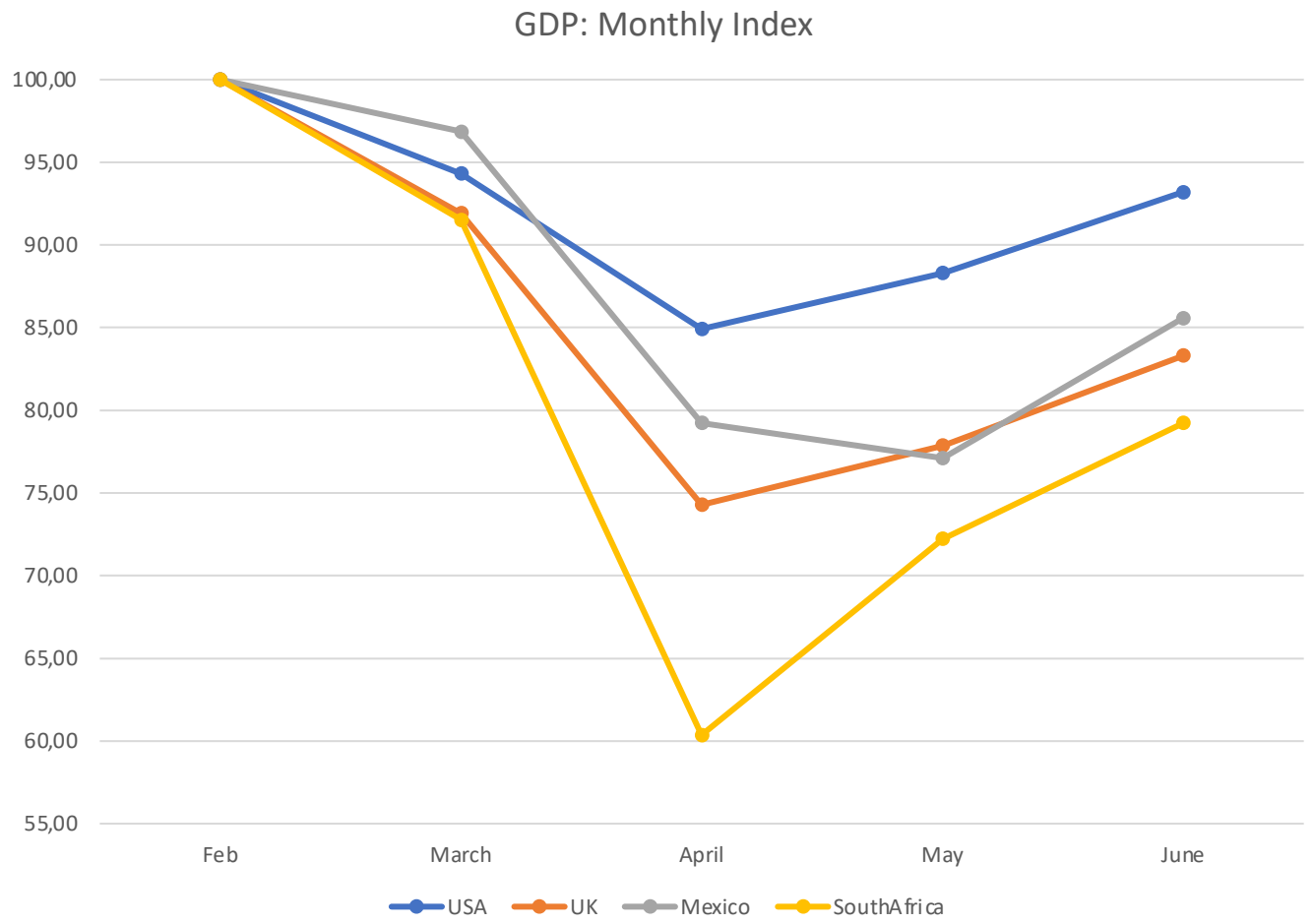
Comparative Macro Data: 2019

Country	GDP	Population	GDP	C	I	G	E	M
	$ Billions	Millions	$ Per Capita	Ratio to GDP (%)				
South Africa	351.4	58.6	6,001	60.2	17.6	21.3	29.9	29.4
Mexico	1,258.3	127.6	9,863	65.4	21.4	11.6	39.1	39.1
United Kingdom	2,827.1	66.8	42,300	64.9	17.4	18.9	31.5	32.7
United States	21,374.4	328.2	65,118	68.2	20.2	14.1	11.7	14.7

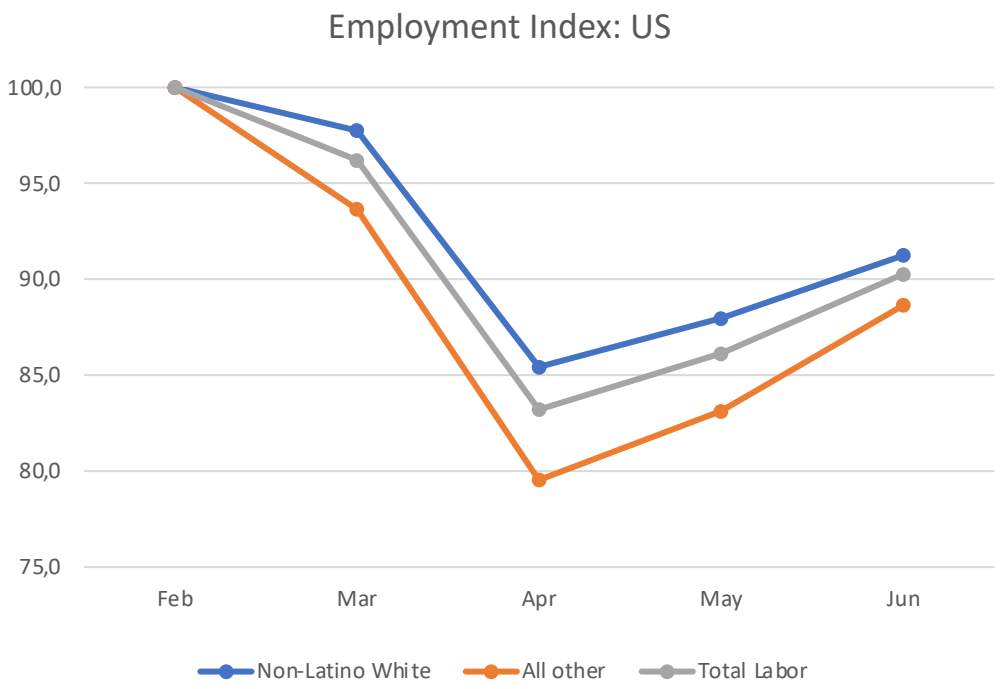
Notes: C = Consumption, I = Investment, G = Government, E = Exports, M = Imports

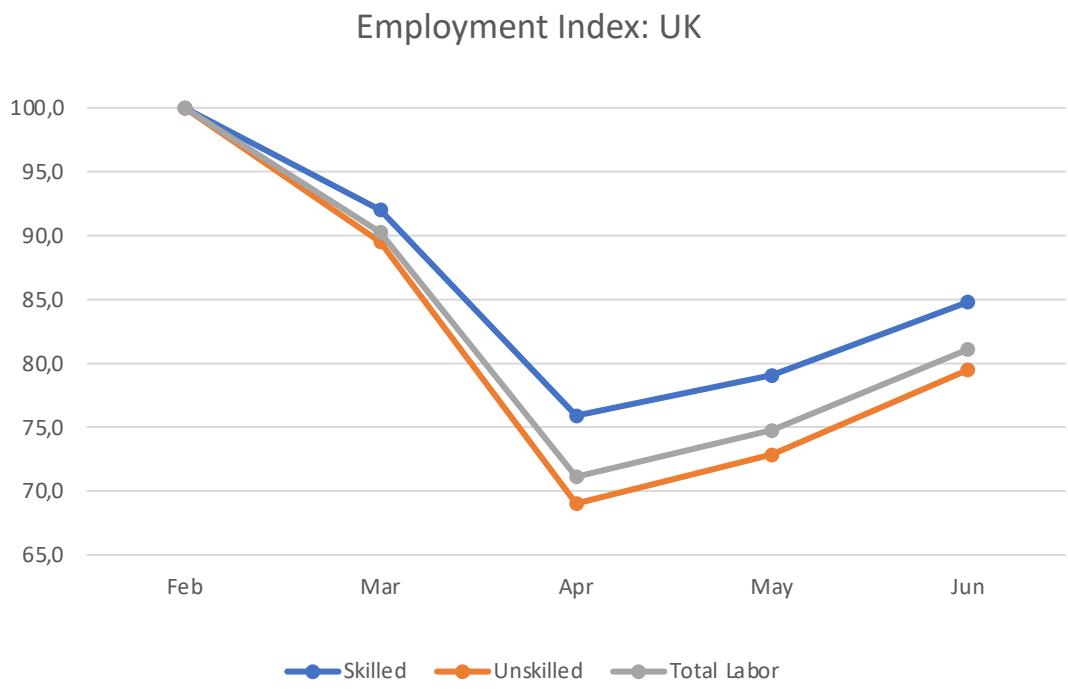
Source: World Bank, World Development Indicators, 2019

GDP Projections by Month, Four Countries



Employment Impacts





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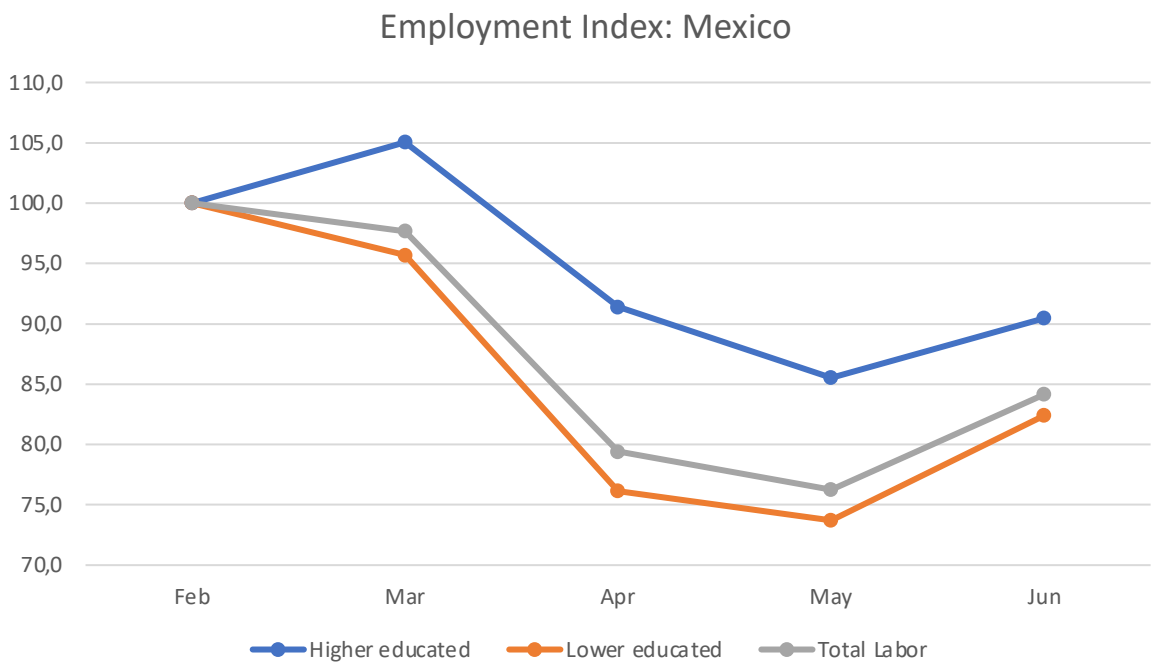

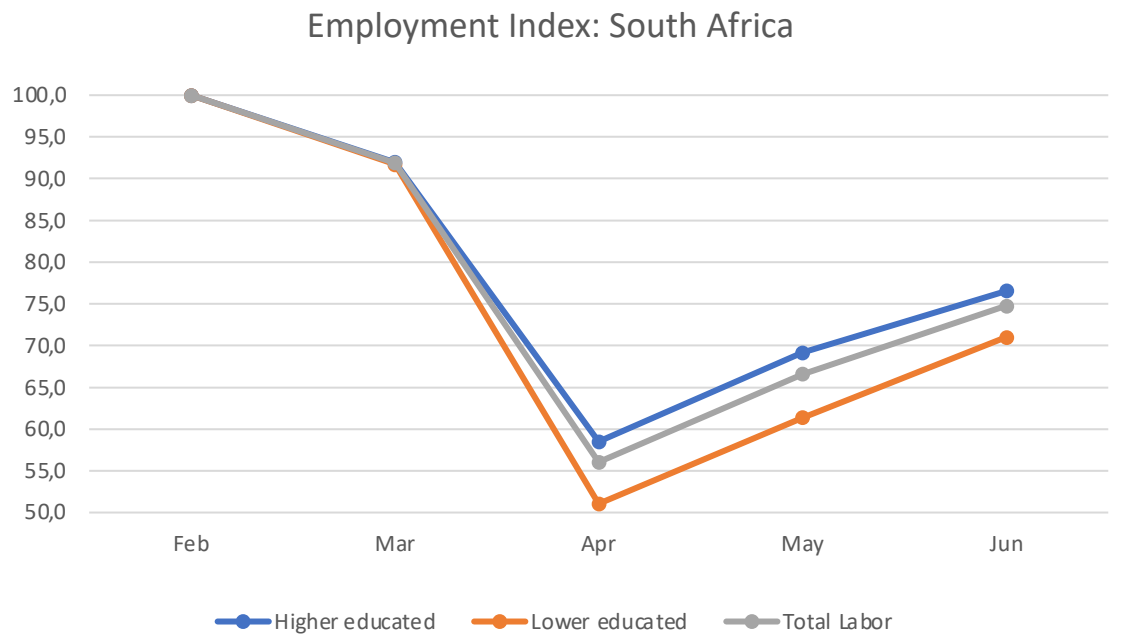

The bottom and most vulnerable part of the income distribution hit hardest

- The sectors that are hit the hardest by the lockdown measures have high shares of low skilled labor: e. g. hotels, restaurants, pubs/bars, services to households, retail, construction
- UK among less generous social safety nets and unemployment insurance in Europe. US even less generous.
- Among developing countries, South Africa has extensive income support for poor households, but less than European standards. Mexico is worst of the four countries.

Household Income Support

- The pandemic and economic policies to control it are hitting low-skill workers and poor households in all countries
  - Need for social safety net and income support policies for low-income households
- We can use the SAM-multiplier model to consider the impacts at both the household and macro levels of income support for low-income households
  - Direct support plus Keynesian macro multipliers of fiscal policy of income support
- We save the SAM for June and then model the impact of additional government income support for poor households in all four countries
  - The shocked SAM describes current situation and is a good starting point for considering recovery scenarios

Modelling Medium/Long Term Recovery Scenarios

- Recovery will involve structural changes and market interventions over the medium to long run
  - SAM-multiplier model, with fixed prices and short-run quantity adjustments, is not a suitable tool for analysis of such scenarios
- Computable General Equilibrium (CGE) models are the appropriate tool
  - CGE models are designed to capture incentive effects of government policies on agents
  - Medium-term analysis (5-10 years): single-country and multi-country models
- Important role of international trade: Single- and multi-country models
  - Changes in the structure of production, exports, imports
  - Foreign investment, trade balances, real exchange rate

International Trade

- South Africa in the regional and global economy
  - Regional integration in AfCFTA, SACU, SADC, NEPAD, etc.
  - Bilateral trade agreements: US-Kenya, UK-Kenya, EU agreements, EBA, AGOA
  - Trade as an engine for growth
- Use of multi-country CGE models
  - GLOBE mode for analysis of various African trade reform/integration scenarios
  - Use of GTAP global data set
- Existing trade flows between Africa and major regional economies
  - GTAP 10 data base: 2014 data

Bilateral Trade by Region as Share of Global Trade

	NAFTA	Europe	E-SE-Asia	Other	Total exports	Percent of global GDP
NAFTA	**5.5%**	**3.1%**	**2.9%**	**2.5%**	**14.0%**	**26.7%**
USA	2.4%	2.4%	2.4%	2.1%	9.4%	
Rest of NA	3.1%	0.6%	0.5%	0.5%	4.6%	
Europe	**3.6%**	**20.8%**	**4.5%**	**6.4%**	**35.2%**	**25.2%**
EU-27	2.8%	17.8%	3.5%	5.2%	29.3%	
United Kingdom	0.5%	1.7%	0.5%	0.6%	3.2%	
Rest of Europe	0.3%	1.4%	0.5%	0.5%	2.6%	
E-SE-Asia	**5.5%**	**4.9%**	**13.5%**	**5.8%**	**29.6%**	**27.5%**
Other	**2.8%**	**5.8%**	**6.2%**	**6.5%**	**21.2%**	**20.6%**
Total imports	17.3%	34.5%	27.0%	21.2%	100.0%	100.0%

Note: Exports from row to column.

Source: GTAP v10, 2014

Export Shares (% Row to Column)

	Kenya	SACU	Other Africa	USA	UK	EU-27	E&SE Asia	South Asia	Rest of World	Total
Kenya	0.0	0.5	24.9	12.9	7.4	22.9	11.6	5.5	14.4	100.0
SACU	0.6	12.3	12.7	7.4	5.3	17.5	25.6	6.9	11.7	100.0
Other Africa	0.3	2.4	5.9	7.2	2.9	34.8	21.7	7.7	17.1	100.0
USA	0.0	0.4	2.3	0.5	3.9	20.5	26.6	1.6	44.2	100.0
UK	0.1	0.7	2.3	11.5	0.0	46.1	16.4	1.7	21.2	100.0
EU-27	0.0	0.5	2.8	7.6	6.8	51.6	12.2	1.2	17.2	100.0
E&SE Asia	0.1	0.5	2.4	14.8	2.4	13.6	46.7	3.6	15.9	100.0
South Asia	0.8	1.4	5.7	14.6	5.3	22.4	21.1	5.5	23.2	100.0
Rest of World	0.1	0.4	2.1	22.5	2.9	22.4	25.4	5.0	19.3	100.0

Import Shares (% Row from Column)

	Kenya	SACU	Other Africa	USA	UK	EU-27	E&SE Asia	South Asia	Rest of World
Kenya	0.0	0.0	0.3	0.0	0.1	0.0	0.0	0.1	0.0
SACU	3.9	12.6	3.1	0.4	0.9	0.4	0.6	1.4	0.4
Other Africa	6.4	8.9	5.2	1.3	1.7	2.8	1.8	5.9	2.0
USA	3.0	6.0	8.5	0.4	9.4	6.8	9.3	5.2	21.3
UK	3.8	3.4	2.9	3.0	0.0	5.1	1.9	1.8	3.4
EU-27	10.1	23.4	31.2	18.1	50.9	52.6	13.3	11.6	25.6
E&SE Asia	40.5	26.1	27.0	35.7	18.4	14.1	51.5	35.4	24.0
South Asia	20.4	5.2	5.2	2.8	3.2	1.8	1.9	4.3	2.8
Rest of World	11.9	14.3	16.7	38.2	15.4	16.3	19.7	34.4	20.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0