

# An Economy-Wide Approach to COVID19 Crisis, Energy and Sustainability

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# Introduction

- ▶ This paper estimates the impact of COVID19 mainly in the short-run (2020-22) arising from disruptions in the global and regional trade for three oil importing developing countries (Afghanistan, Jordan, Turkey).
- ▶ It also presents some early findings on how changes in global oil prices impact economies, and emissions during the COVID19 crisis and in its aftermath.
- ▶ We adopted an economy-wide modeling approach.
- ▶ The Global Trade Analysis Project (GTAP) framework was used with some updates to the underlying standard dataset. GTAP is a multi-region, multisector, Computable General Equilibrium model, with perfect competition and constant returns to scale <https://www.gtap.agecon.purdue.edu/>
- ▶ We added Afghanistan to the standard GTAP database and updated the latest version of the GTAP global dataset from 2014 to 2018 for 38 countries with 35 sectors for each country.

# Economy-wide Impact of COVID19

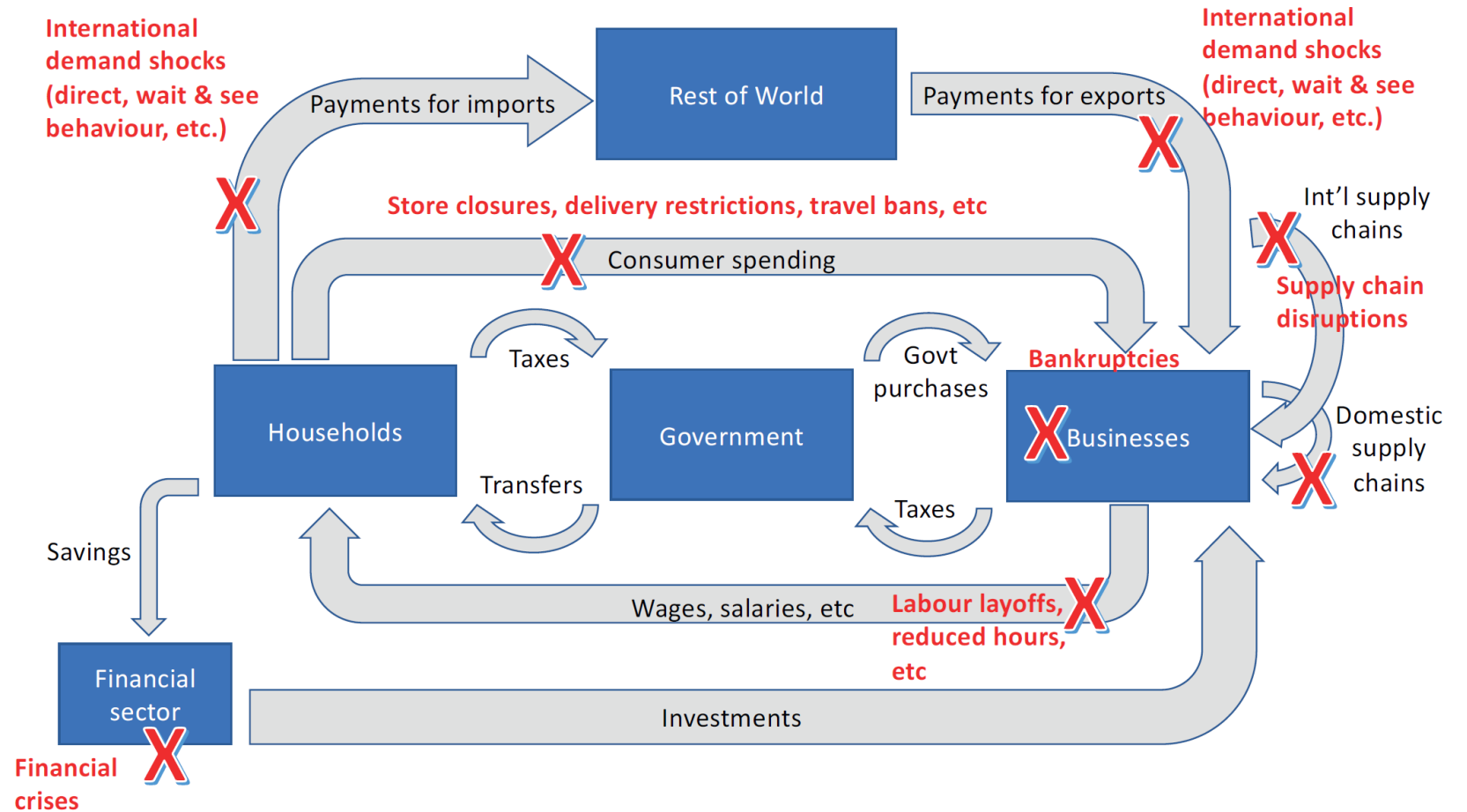
**Economy-wide Approach:** Involves the whole economy

**Computable General Equilibrium Model**

Short-run (next 2 years) arising from disruptions in the global and regional trade

**COVID19 impact disseminated through**

Interruption of businesses, supply chain disruptions, labor layoffs, etc.



Source: Based on Baldwin (2020b).

# Early Assessments on Global Economy



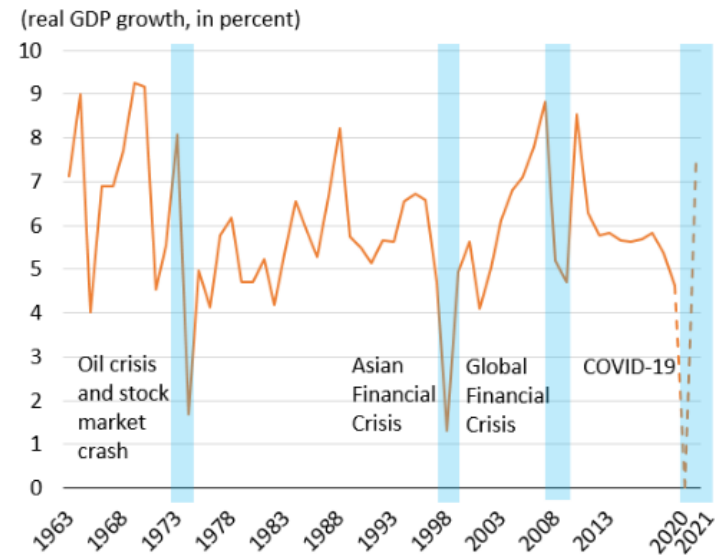
Early assessments of COVID-19 impact on developed countries in 2020 (e.g. in Germany, USA and China) indicate a fall of 5% to 10% of GDP

Global growth is projected to be reduced by 4.5 percentage points in 2020 (minus 2.2% instead of an earlier projected rate of 2.3%) (The Economist, March 27, 2020).

International demand and supply shocks can be transmitted via upstream and downstream linkages, falling consumer demand and investment owing to falling incomes and worsening expectations.

## Historic fall

The COVID-19 crisis is expected to inflict steep declines in output across Asia.



Source: IMF Staff calculations.

INTERNATIONAL MONETARY FUND

# Economy-wide Analyses: 3 Case Studies

- UNDP (2020) - **Afghanistan** SDG Platform: Socio-economic impact of COVID19 Country Note (shared with Ministries)
- World Bank (2020) - **Jordan** PforR for Economic Opportunities for Jordanians and Syrian Refugees - COVID19 Impact in the Economic Baseline
- COVID19 Impact and Recovery Options for **Turkey** (in progress)

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## ASUMPTIONS USED IN MODEL SIMULATIONS

- ❖ Big and small decline in global trade (13% and 7%)
- ❖ Low oil price scenario : World prices for crude and refines prices decline by 40% with respect to 2019 average (~24USD/b)
- ❖ Constant oil price scenario: World prices for crude oil and refined oil prices stay constant at their 2019 average (~60USD/b)

Impact of Covid-19  
due to Global and Regional Economic Effects Change from GDP without COVID19  
- No Policy Response -

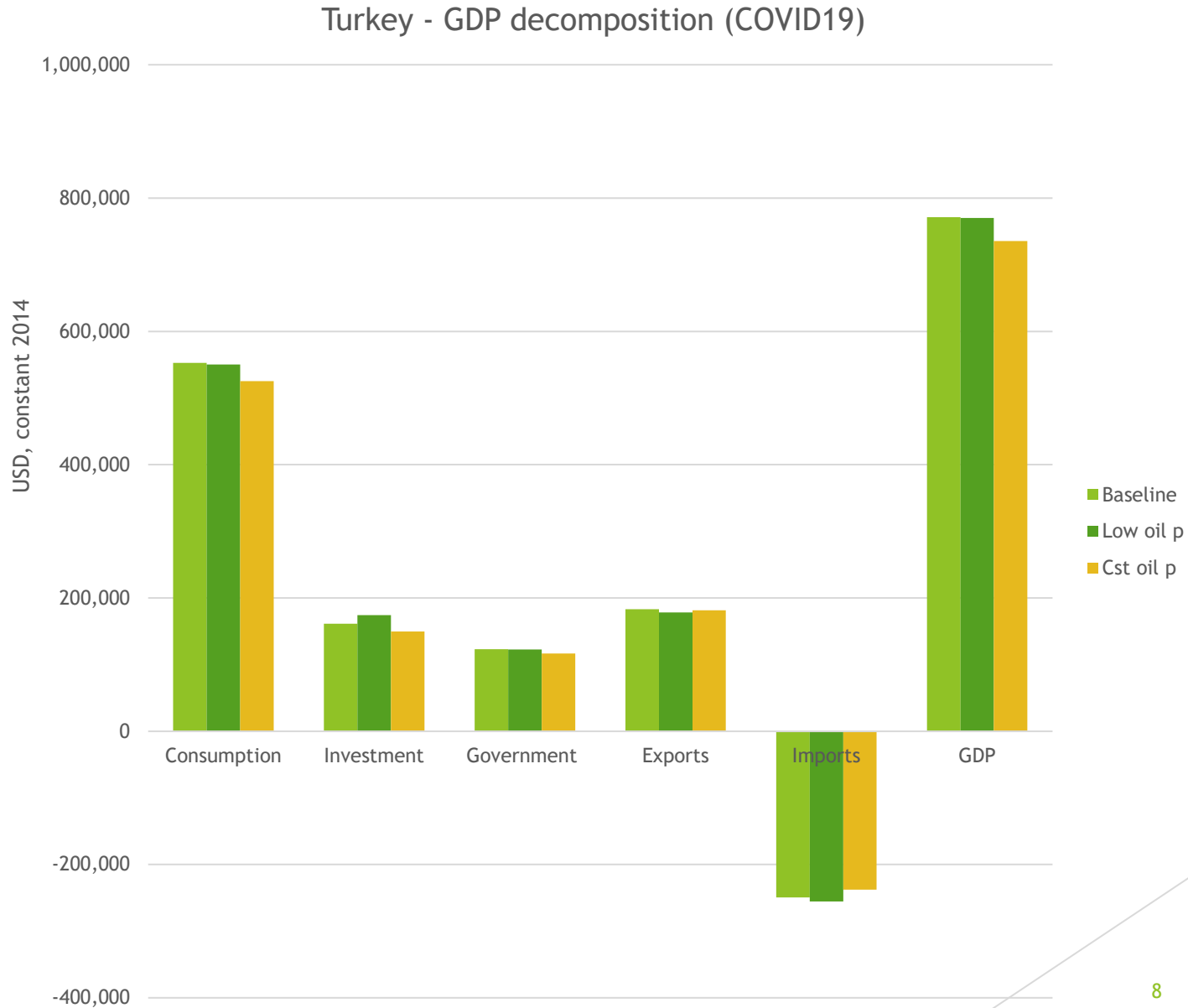
Initial Conditions		Cumulative Change in Real GDP (% points)	
<b>AFGHANISTAN</b>	Estimated number of returnees from Iran remain at the current level (150,000)	A.	-7.8% of GDP assuming global trade declines due to the slowdown of the Chinese economy that leads to a reduction in global trade by (7%)
		B.	-13.7% of GDP assuming reduction in global trade like in the 2008 Global Financial Crisis (13%)
	World prices for crude oil and gas decline by 40% compared to their average level in 2019	C.	-5.4% to -17.3% of GDP assuming Afghanistan's exports to and imports from its main partners (Pakistan, Iran, India and Kazakhstan) decrease respectively by 8% and 25%
Initial Conditions		Cumulative Change in Real GDP (% points)	
<b>JORDAN</b>	World prices for crude oil and gas decline by 40% compared to their average level in 2019	A.	-4.9% of GDP assuming global trade declines due to the slowdown of the Chinese economy that leads to a reduction in global trade by (7%)
		B.	-9.69% of GDP assuming reduction in global trade like in the 2008 Global Financial Crisis (13%)
		C.	-0.79% to -0.97% of GDP assuming Jordan's exports to and imports from its main partner EU27 decrease respectively by 8% and 25%
<b>TURKEY</b>	World prices for crude oil and gas decline by 40% compared to their average level in 2019	A.	-1.96% of GDP assuming global trade declines due to the slowdown of the Chinese economy that leads to a reduction in global trade by (7%)
		B.	-4.46% of GDP assuming reduction in global trade like in the 2008 Global Financial Crisis (13%)
		C.	-2.07% to -2.78% of GDP assuming Turkey's exports to and imports from its main partner EU27 decrease respectively by 8% and 25%

Source: Own estimates based on GTAP model simulations

# Low oil prices help alleviate the adverse impact of COVID19 crisis

If, 13% decline in global trade: Turkey's GDP is likely to decrease between 4.46% and 5.16% due to COVID19 respectively in low oil prices or constant oil prices scenario.

However, low oil prices are likely to boost investment



Source: Own estimates based on GTAP model simulations



## Turkey- Most Impacted Sectors by COVID19

COVID19 Impact on Sectors (% Δ with respect to pre-COVID19)	Low oil p %Δ	Cst oil p %Δ
Energy industries (refineries)	104	9.15
Manufacturing industries and construction	-8	4.77
Transport	1	-0.16
Other sectors	-11	-1.64
GDP	-4	-5.16

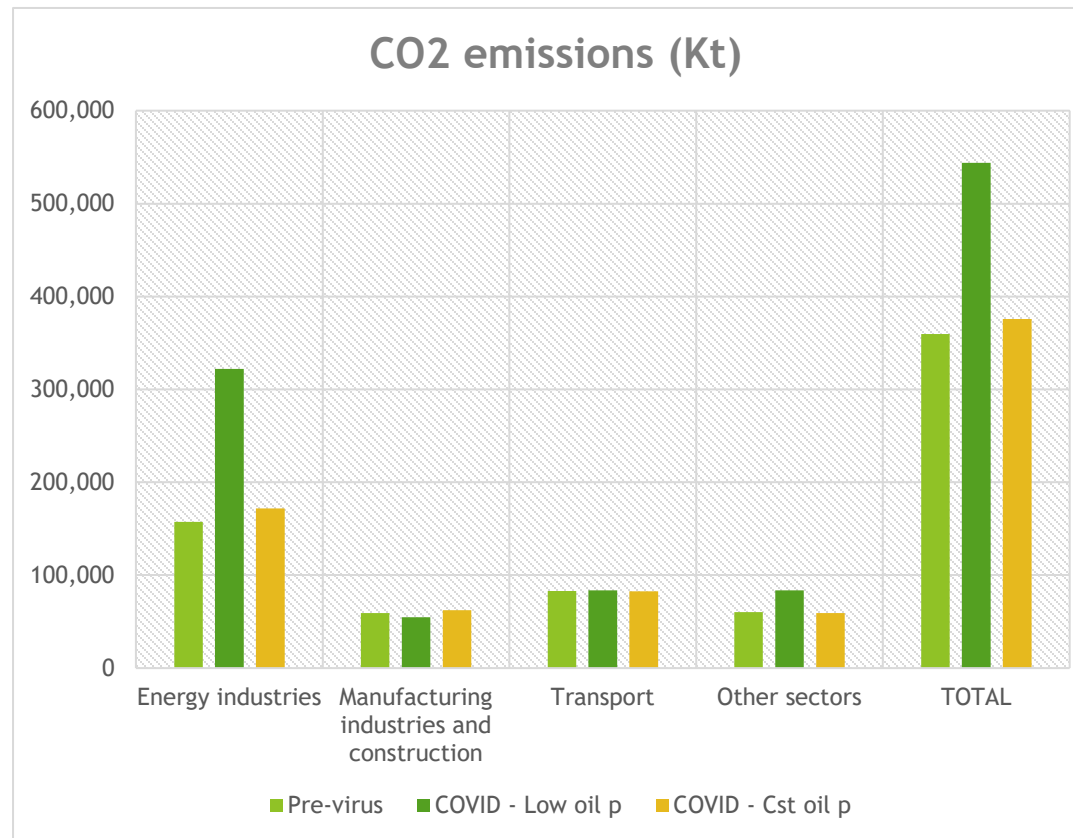
Source: Own estimates based on GTAP model simulations

# CO2 impact in the short term

## Background

- ▶ Turkey is the world's 20th largest emitter of greenhouse gases (GHGs).
- ▶ Energy industries were the main contributor of GHG emissions from fuel combustion with 41%.
- ▶ It is followed by transportation sector with 23.2%, manufacturing industries with 16.9%, residential, commercial and institutional sector with 16.1% and, agriculture, forestry and fishing sector with 2.8%.
- ▶ **It is important to consider sustainability in the COVID19 recovery phase**

## Post COVID19 - Impact of oil prices



Source: Own estimates based on GTAP model simulations

## Afghanistan - Recovery from COVID19

**AFGHANISTAN - Medium Case Scenario for the Change in GDP under Different Funding Options for the Expected Costs for Combatting the Impact of Covid-19 (\$250 million), 2020-23 (percentage change compared to end-2019 GDP level)**

**-1.32% of GDP** assuming expenditure switching from other public services (neutral deficit impact)

**0.03% of GDP** assuming grants (not loans) from donors

**2.11% of GDP** assuming greater regional cooperation (Pakistan, Iran, India and Kazakhstan) leading to a reduction in trade costs by 2.8%

**It is important to consider sustainability in the recovery phase**

Source: Own estimates based on GTAP model simulations

# Thank you...

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