Structural Transformation Options of the Saudi Economy Under Constraint of Depressed World Oil Prices

Salaheddine Soummane, Frédéric Ghersi, and Franck Lecocq

Centre Internation de Recherche sur l'Environnement et le Développment – CIRED

June 8, 2021

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Research questions

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- How can economic diversification and reforms mitigate global climate policy impacts for Saudi Arabia, and help achieving national climate commitments?

This is one of the first assessments of diversification policy and energy sector reforms as a mitigation tool for an oil-dependent economy[a] and the first for Saudi Arabia.

[a] See e.g., Shehabi, 2020, for an illustration for Kuwait.

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UNFCCC, 1992

Recognising the special difficulties of those countries, (...) whose economies are particularly dependent on fossil fuel production, use and exportation, as a consequence of action taken on limiting greenhouse gas emissions.

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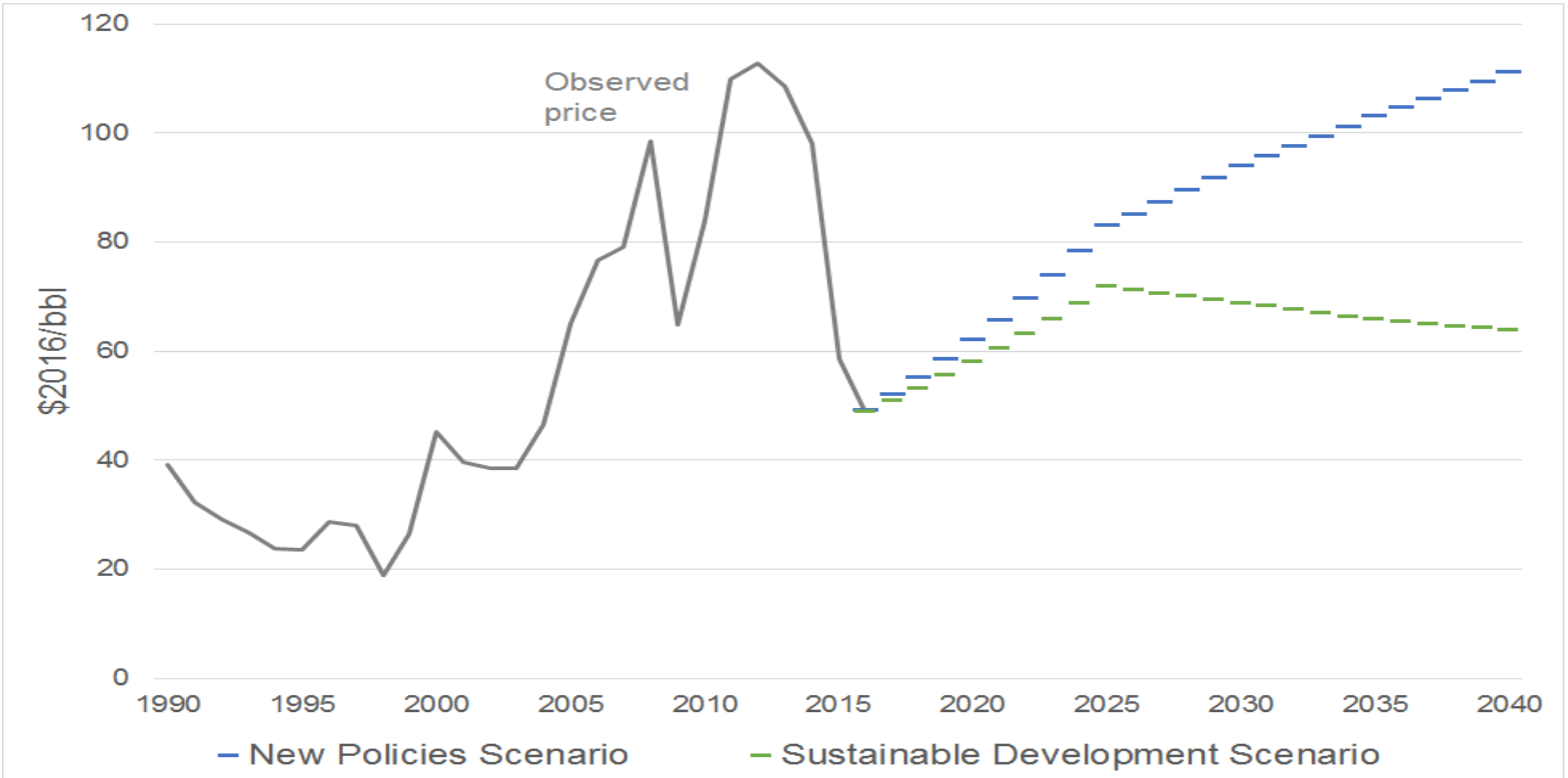
OPEC, 2017

(...)The unique situation of developing countries – including those developing countries dependent on oil – should be given the priority it deserves.

Strengthening Climate policy could cause a structural weakening in oil prices as the global demand decreases

Figure: Oil price by IEA scenario



Source: IEA (2017).
Note: Oil price projections are derived by linear interpolationof 5-year data provided in IEA (2017).

Climate policy implementation will cause losses for oil exporters of the Middle East

Export revenue decline as oil price drop will induce economic losses for Middle East oil exporters

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IMACLIM-SA: Accounting for specific features of the Saudi economy

Currency peg

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Saudi Arabia uses its reserve assets as a buffer to absorb oil price decline. This translates into low sensitivity of investment to oil price variations compared to savings (translating into the Johansen closure).

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Administered energy prices

Domestic energy prices (oil, natural gas, refined products and electricity) are administered by the government.

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Continuity scenario

- $<2°C$ consistent oil price.
- Unreformed domestic energy prices.
- No energy efficiency gains.
- Export-driven growth of Minerals, Petrochemical, and Cement.

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Transformation scenario

- $<2°C$ consistent oil price.
- Reforming domestic energy prices and corporate tax.
- Recycling revenues as investment in non-energy intensive sectors.
- Assuming energy efficiency gains.
- Fostering Services and Manufacture exports.

Table 1. Summary of modelling results at 2030 horizon

Indicator	Calibration 2013	*Continuity* 2030	*Transformation* 2030	2030 variation from *Cont.* to *Transf.*
Real GDP, Bn 2013 SAR	2,773	3,973	4,025	+1.3%
Trade balance, % GDP	+24.6%	+9.8%	+5.6%	–4.3 pts
Cumulated 2013–2030 trade surplus, Bn 2013 USD	—	1,183	994	–16.0%
Unemployment rate	5.6%	8.6%	6.9%	–1.7 pts
Public budget balance, % GDP	+5.6%	–5.2%	+1.0%	+6.2 pts
Net public debt, % GDP	–95.9%	+14.9%	–21.0%	–35.9 pts
CO_2 emissions, Mt	502	913	405	–55.6%

Transformation scenario is associated with higher activity and employment. Moreover, it provides more sustainable debt and emissions outlooks.

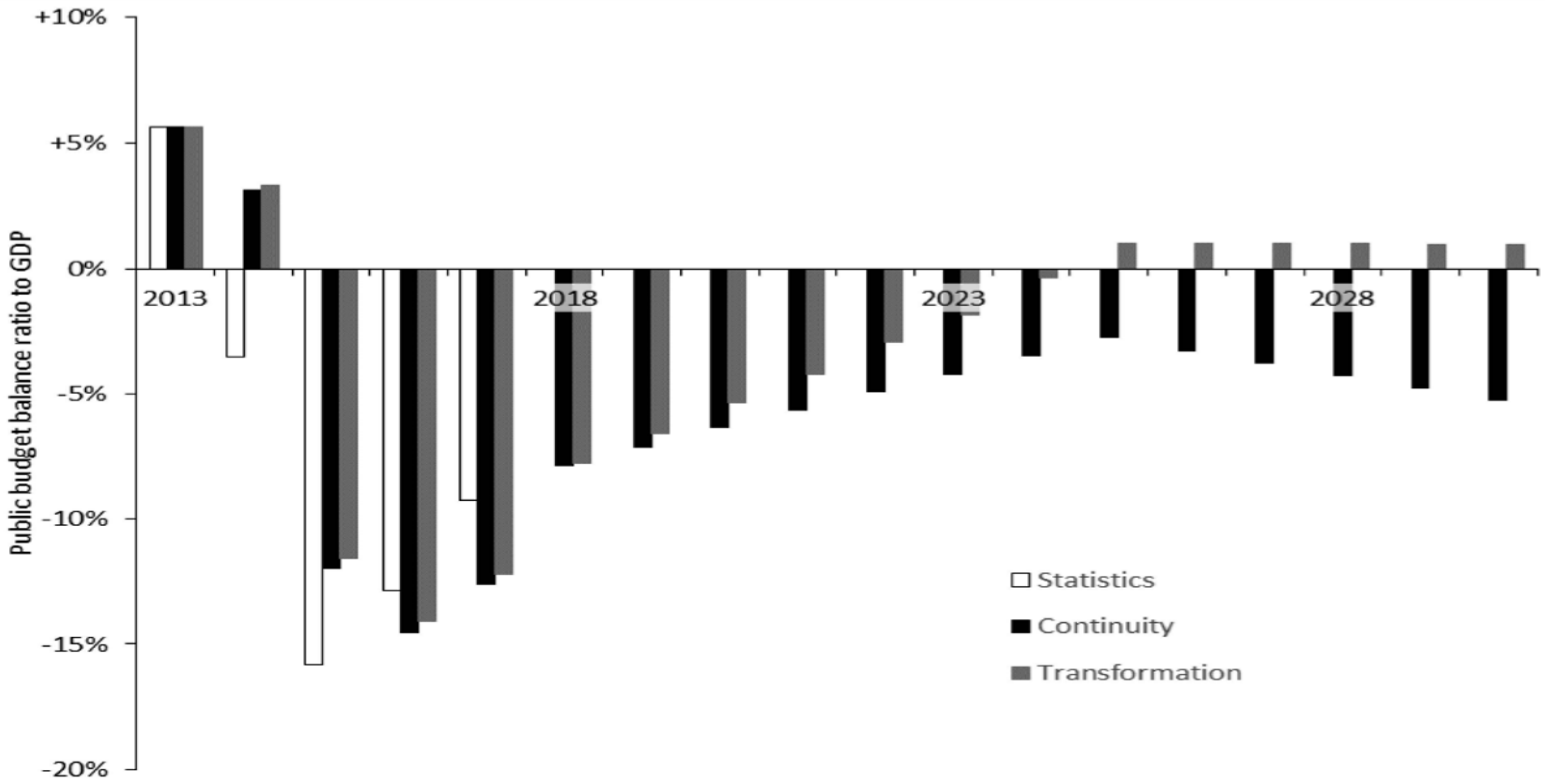
Table 2. Net employment creation by sector, *thousand full-time equivalents*

Sector	*Continuity* 2030 versus 2013	*Transformation* 2030 versus 2013	2030 variation from *Cont.* to *Transf.*
OIL	28.6	16.3	–12.2
GAS	17.4	–0.5	–17.9
REF	11.2	10.4	–0.8
ELE	31.8	12.1	–19.7
AGR	101.1	142.3	41.3
MIN	2.8	0.8	–2.0
CHM	145.6	20.7	–124.9
NMM	77.6	62.3	–15.2
MAN	121.8	216.9	95.1
C&S	3107.7	3436.8	329.2
WTP	8.6	9.1	0.5
ATP	16.0	20.0	4.0
OTP	61.0	53.3	–7.7
Total	*3,731.1*	*4,000.6*	*269.6*

Transformation scenario directs activity toward labour-intensive sectors.

IMACLIM-SAU results: Fiscal outlooks (I)

Figure: Public budget balance by scenario

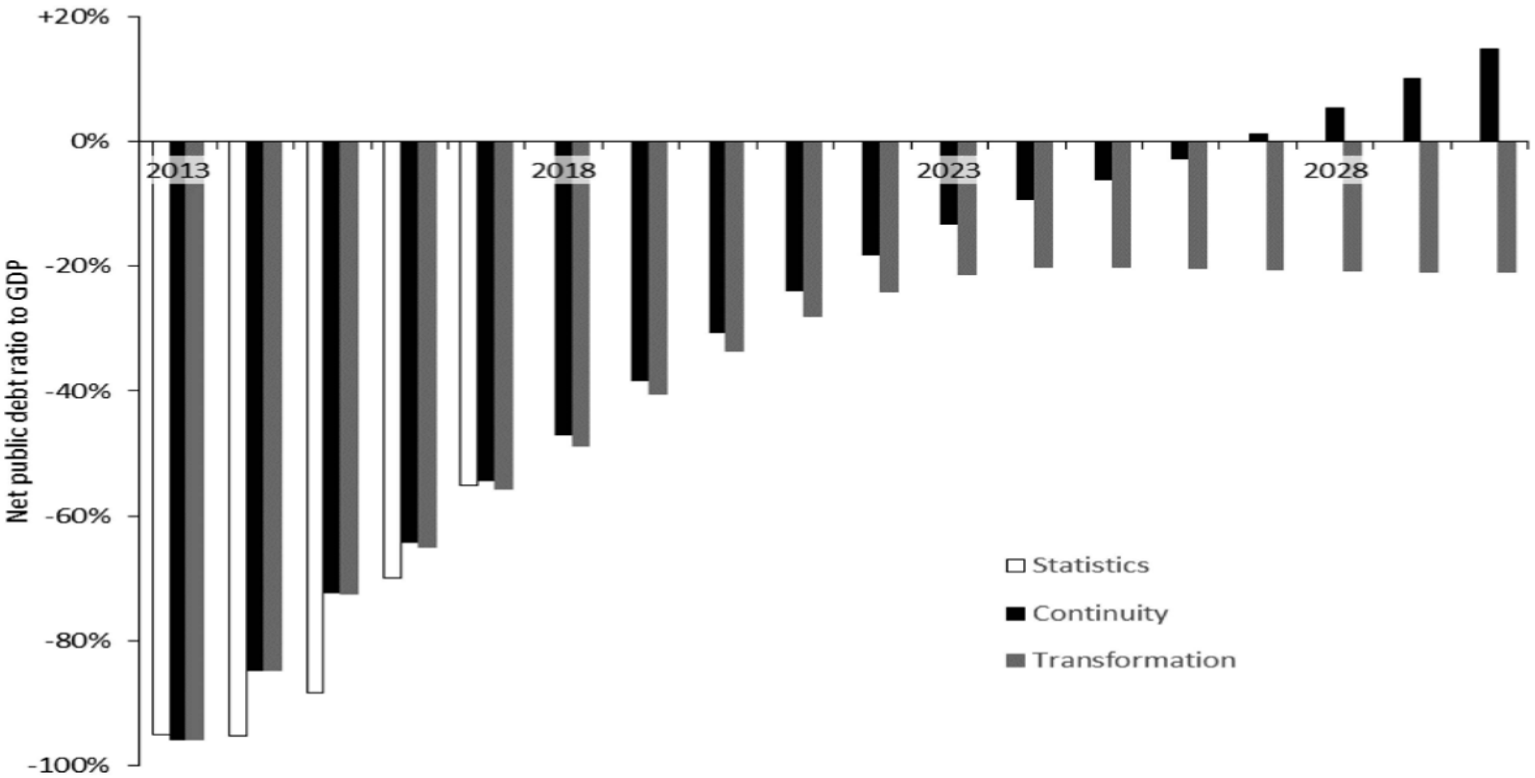


Sources: SAMA (2018) for 2013–2017 statistics and IMACLIM-SAU simulations. The 2014 public deficit that escapes IMACLIM-SAU reflects expenditures growing 15% compared to 2013 mainly because of exceptional military expenditures (+21%) and public investment (+22%) (SAMA, 2018).

Fiscal reforms following adjustment of domestic energy price and corporate tax set the budget balance on a positive path in the Transformation scenario.

IMACLIM-SAU results: Fiscal outlooks (II)

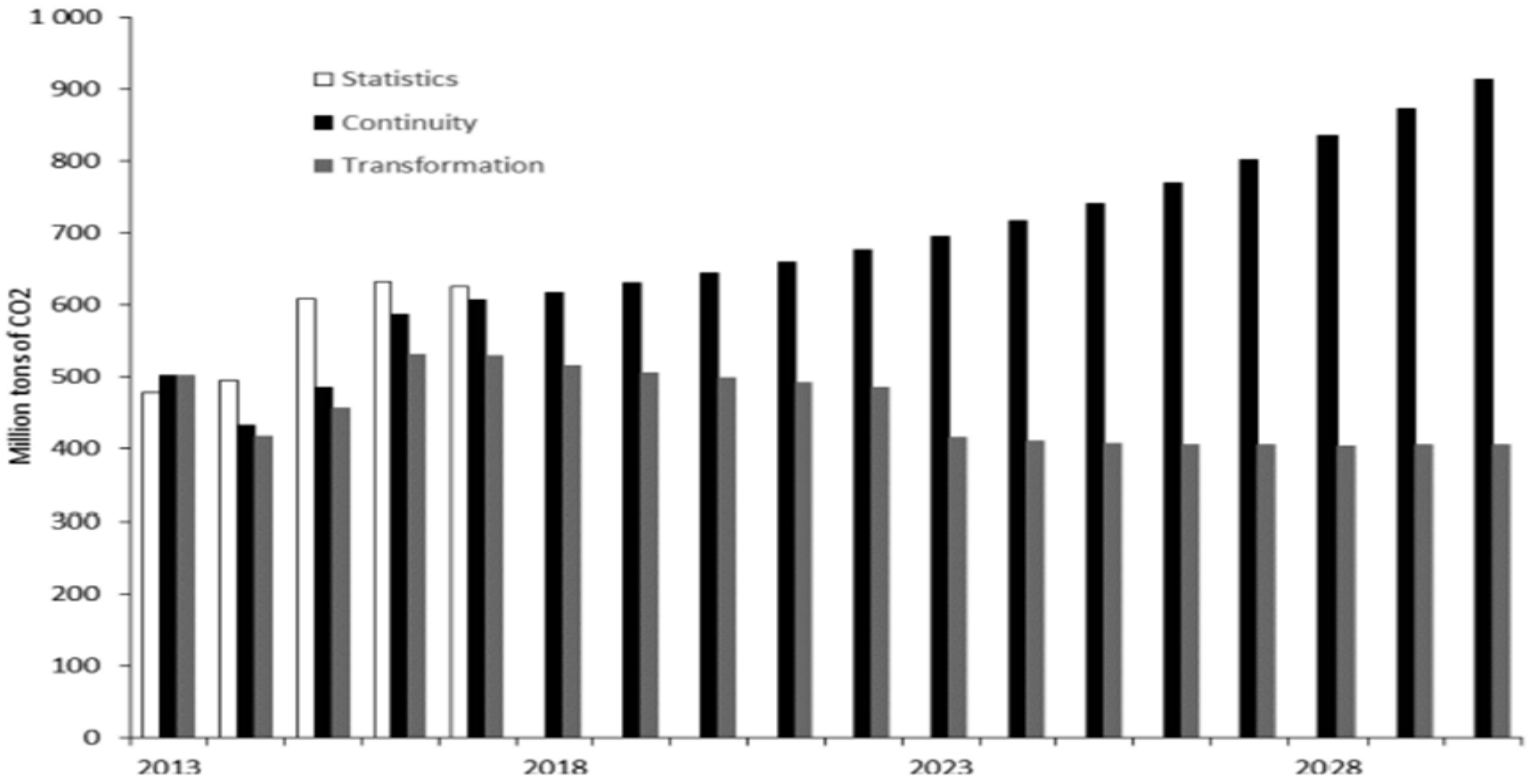
Figure: Net government debt



Sources: SAMA (2018) for 2013–2017 statistics and IMACLIM-SAU simulations.

Reliance on energy-intensive sectors under the Continuity scenario challenges sustainability of the public debt as financial buffers would fade in the mid-term.

Figure: Total CO_2 emissions



Sources: EDGAR database for 2013–2017 statistics and IMACLIM-SAU simulations.

The Transformation scenario abates CO_2 emissions by 55.6% compared with the Continuity scenario.

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Main findings: IMACLIM-SA

IMACLIM-SA allows extending to a multisectoral framework the results of KLEM-SA (Soummane et al. 2019). Our investigation maps two polar diversification strategies:

Continuity of the expansion of energy-intensive industries (minerals, petrochemical, and cement), with extended public support in the form of low regulated energy prices.

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Continuity of the expansion of energy-intensive industries (minerals, petrochemical, and cement), with extended public support in the form of low regulated energy prices.

Transformation via a structural shift towards low-carbon activities, namely services (tourism and financial services) and manufacturing, which allows considering the gradual adjustment of domestic energy prices and complementary fiscal reforms.

Main findings: IMACLIM-SA

Over its projection horizon to 2030, our numerical modelling show:

The proactive diversification strategy of Transformation toward non-energy-intensive sectors and fiscal reforms with higher growth and lower unemployment than Continuity of expansion of energy-intensive industries.

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Over its projection horizon to 2030, our numerical modelling show:

The proactive diversification strategy of Transformation toward non-energy-intensive sectors and fiscal reforms with higher growth and lower unemployment than Continuity of expansion of energy-intensive industries.

By structural change and through reforms of energy prices, Transformation succeeds in containing domestic energy consumptions, whereas Continuity inflates them significantly beyond real economic growth.

The energy-price increases of Transformation induce partial decarbonization of energy supply that leads to stabilization of Saudi CO_2 emissions, ending at a level largely below that of Continuity emissions.

IMACLIM-SA results dissemination

The presented findings (and more!) are due to appear as:

Soummane, S., F. Ghersi and F. Lecocq (2022). "Structural Transformation Options of the Saudi Economy Under Constraint of Depressed World Oil Prices." The Energy Journal 43(3): 181-200.

Thank you for your attention

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