Employment impacts of an oil price shock

Niven Winchester & Dominic White

Model overview

- Static computable general equilibrium (CGE) model simulated for 2025
- Represents two regions (New Zealand and Rest of World) and 33 sectors
- The model is calibrated to the benchmark year using the Global Trade Analysis Project (GTAP) Database
- The model is calibrated to 2025 using projections (GDP, labour force, land use etc.) from the C-PLAN model and other sources

Sectors

Agriculture, forestry & fishing	**Energy-intensive manufacturing**
Dairy farming	Chemical, rubber & plastic products
Beef and sheep farming	Cement manufacturing
Other animal products	Non-ferrous metals (e.g., aluminium)
Fruit and vegetables	Iron & steel
Other horticulture	
Forestry	**Other manufacturing**
Fishing	Mining of metal ores
	Dairy products
Energy extraction & distribution	Meat products
Crude oil extraction	Other food processing
Refined oil products	Wood and paper products
Coal extraction	Textiles, clothing & footwear
Natural gas extraction and distribution	Motor vehicles and parts
Electricity, transmission and distribution	Other manufacturing
Transport	**Construction & services**
Road Transport	Construction
Air transport	Accommodation and food services
Water transport	Business services
Private transport	Other services

Model specifications and closures

- Decision making is based on real prices (there are no nominal prices in the model)
- Flexible real wages
- Full employment
- Fixed capital account balance and adjustments in the (implicit) real exchange rate
- Endogenous government deficits (surpluses) funded by lump sum transfers from (to) households

Benchmark representation of the global economy

Baseline external drivers — e.g., GDP and land use projections

Baseline representation of the global economy in 2025

Oil price shock

Global economy in 2025 with oil price shock

Scenarios

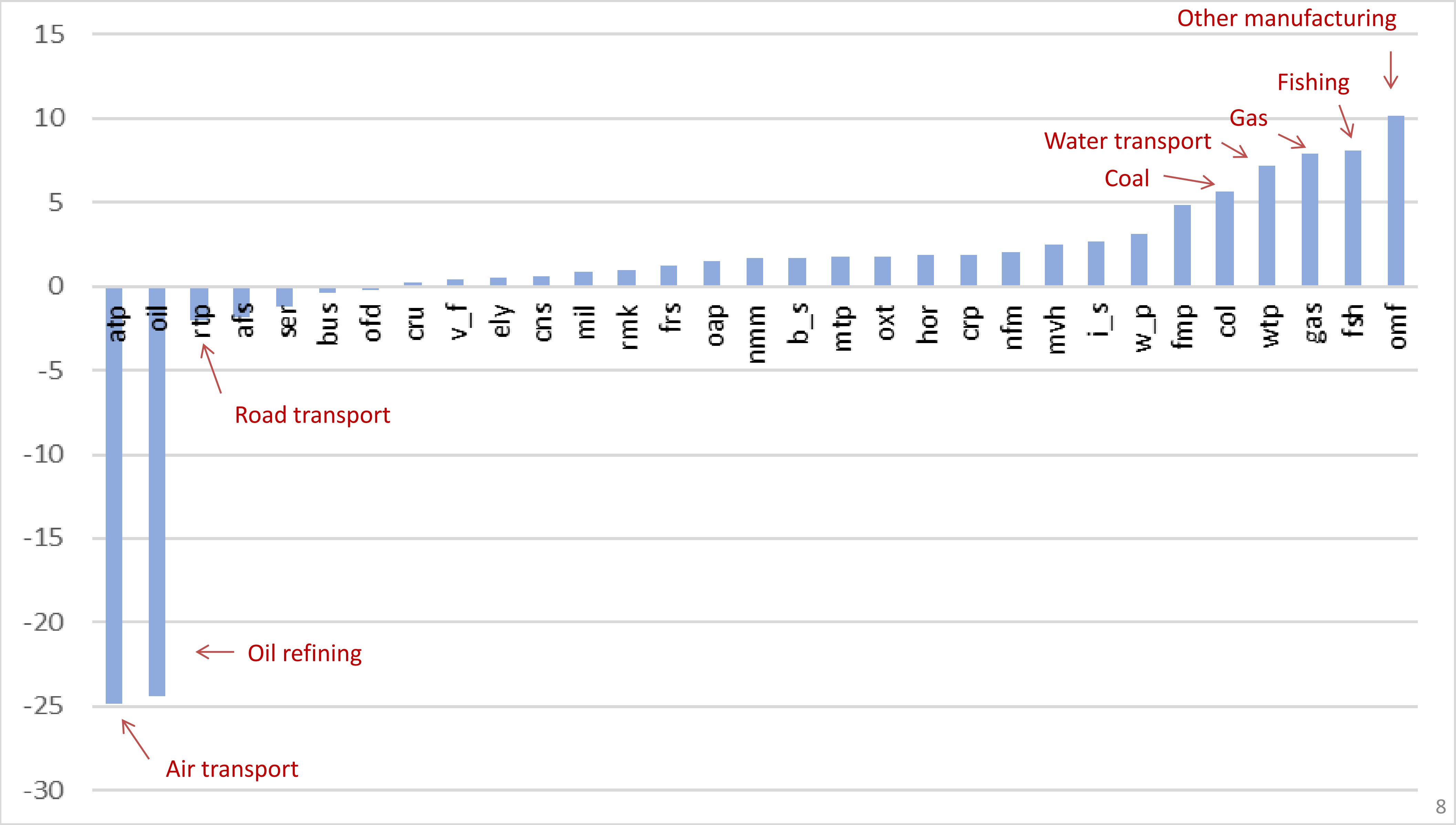
- Two scenarios are considered:
  1. **baseline**: Business as usual in 2025
  2. **shock**: Oil price of USD 250/bbl (compared to USD 109 in the baseline)

- The impacts of the oil price shock are evaluated by comparing results for the **shock** scenario to those for the **baseline** scenario

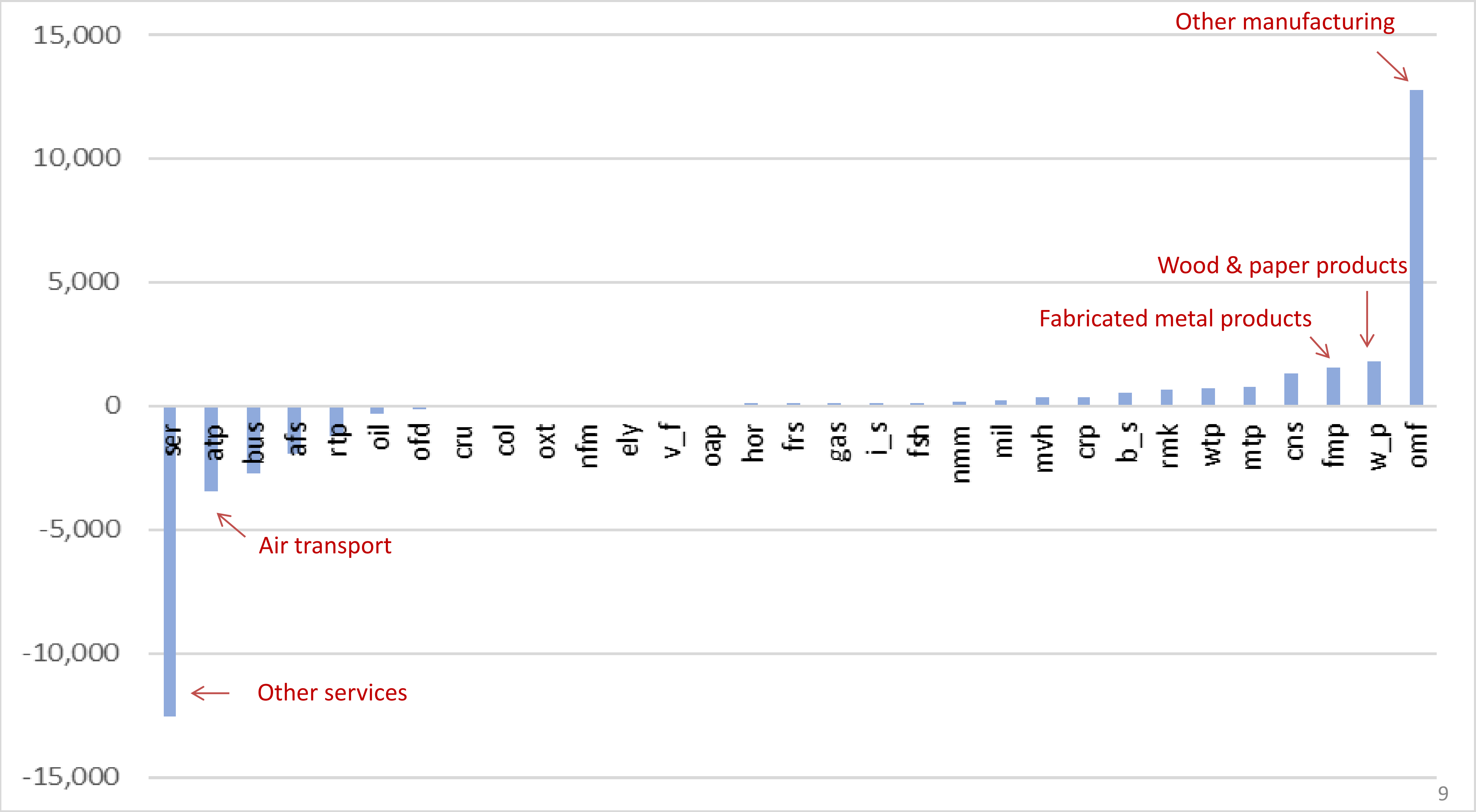
New Zealand GDP and welfare, % change relative to baseline

	shock
GDP	-7.5%
Welfare	-9.3%

Employment changes by sector, 2025 ,%



Employment changes by sector, 2025, number of workers



Conclusions

- An increases in the oil price from USD 109/bbl to USD 250/bbl reduces New Zealand GDP by 7.5%
- Proportional decreases in employment are largest in air transport, oil refining, and road transport
- Proportional increases in employment are largest for other manufacturing, water transport (substitution to less oil intensive transport), gas, and coal (substitution away from oil to other forms of energy
- Absolute employment decreases are largest for other services and air transport
- Absolute employment increases are largest for other manufacturing and wood and paper products