MATRA WORKING PAPER · NOVEMBER 2026

The lasting economic cost if the US/Israel–Iran war reignites

A dynamic dual-model assessment

David Radi
Matra

Matra working paper, November 2026.

ABSTRACT

At the end of February 2026 the United States and Israel launched a surprise war against Iran that drew in the Gulf states, and it has since settled into a stalemate: strikes have largely stopped since September, talks have stalled, and the United States has threatened a new round of strikes that could plunge the Gulf into war again. We estimate what the conflict has cost so far and what it would cost if it reignites. The conflict cut Gulf output of crude oil, refined products and aluminium, cut exports of liquefied natural gas (LNG) and urea fertiliser, cut Iran's exports, and raised the cost of shipping energy through the Strait of Hormuz. We model these channels together, with the strait as one among several. We use a recursive dynamic (year-by-year) global computable general equilibrium (CGE) model, GTAP-RD (Corong et al., 2017; Aguiar, Corong and van der Mensbrugghe, 2019), on a 2022 global database built from the OECD Inter-Country Input-Output tables, to estimate what the war costs and what six more months of fighting would add. Two scenarios are compared with a no-war baseline: the war ends in 2026, or it reignites for six more months of fighting in 2027. The shocks are measured country by country from production, shipping and insurance data, and enter the model mainly as lost Gulf oil and refining output. All GDP results are differences from a world without the war: a result of −30% means that real GDP in that year is 30% lower than it would otherwise have been, not that the economy shrank by 30%. On this measure, in 2026 Qatar's GDP is 30% lower than without the war, that of Iraq, Kuwait and Bahrain (modelled as one group) 19% lower, Saudi Arabia's 6.7% and the UAE's 4.8%. World GDP is 0.32% lower, and the GDP of the large Asian importers is up to 0.3% lower. We find that six more months of war would leave a lasting mark: Gulf GDP stays further below its no-war path for years after the fighting ends than if the war ends in 2026. In 2030, Qatar's GDP would be 4.9 points lower than if the war ends in 2026, that of Iraq, Kuwait and Bahrain 1.2 points lower, the UAE's 0.45 points and Saudi Arabia's 0.38 points. Applying the same disruption as a shock to exports rather than a shock to production gives smaller war-year losses for the Gulf Arab exporters and larger importer losses, though much of the extra importer loss comes from how the export cut is modelled; we report it as a sensitivity. A separate short-run price model puts Brent crude 66% above its no-war level in 2026; if fighting continues into 2027, Brent would average about $140 a barrel in 2027 if oil stocks (commercial and government) can be drawn as in 2026, against $84 if the war ends in 2026 and $53 with no war.

1. Introduction

On 28 February 2026, the United States and Israel launched a surprise war against Iran, disrupting the Gulf economy on several fronts at once, as Iran retaliated by striking energy facilities in the countries hosting US bases (NPR, 2026; Al Jazeera, 2026). Gulf output of crude oil, refined products and aluminium fell, and exports of LNG and urea fertiliser were cut (EIA, 2026; IEA, 2026a; EGA, 2026; UN Comtrade, 2026): Qatar's LNG exports fell from about 6.4 million tonnes a month to 0.23 million tonnes in April (20Cube, 2026), and Iraq, Kuwait and Bahrain (modelled as one group in this paper), which had only a small route around the Strait of Hormuz (Iraq's Kirkuk–Ceyhan pipeline, restarted in March 2026 at about 200,000 to 230,000 barrels a day; S&P Global Commodity Insights, 2026), saw crude output fall by a third over the year (EIA, 2026). Iran's own

exports were cut (Reuters, 2026c). Shipping through the strait also became far more costly. The strait is the only sea route out of the Persian Gulf and normally carries about a fifth of the world's oil and a fifth of its LNG (IEA, 2026b), and war-risk insurance on Gulf tankers rose from about 0.2% to as much as 10% of hull value (S&P Global, 2026).

Strikes have largely stopped since early September 2026, but negotiations have stalled and Washington has threatened a new wave of intensive strikes (CBS News, 2026), and it has reportedly told several Gulf Arab governments to prepare for a short, intense military campaign after the November midterm elections (Wall Street Journal, 2026b; MS NOW, 2026). The question is therefore no longer only what the war has cost, but what one more round would add.

This paper models the main channels of the conflict's economic disruption together. The Strait of Hormuz is one channel, entering as a war-risk shipping cost on Gulf energy that passes through it. The others are the lost Gulf production of crude, refined products and aluminium, the lost exports of LNG and urea, and the cut in Iran's exports. Iran's own war damage and losses outside energy, such as aviation and tourism, are not modelled (Section 7.1). The two closest model studies of the strait, from the Kiel Institute and WIFO, treat its closure as the whole shock (Hinz et al., 2026; Pokhrel, 2026); here it sits beside the losses of production and exports that the 2026 data record.

This paper asks two questions. First, what does the 2026 Gulf conflict cost the world economy, region by region, against a world without the war? Second, what would six more months of fighting in 2027 add to that cost? The second question is the policy one: it puts a figure on the economic value of an early settlement.

We answer these questions with two models. The main one is a multi-region, multi-sector CGE model (Hertel, 1997; Corong et al., 2017), which suits the problem for three reasons. The shock is a supply shock that moves through trade, so bilateral trade flows and substitution between suppliers matter. It hits a few sectors (crude oil, gas, refined products, aluminium and fertiliser) that feed many others, so input-output links matter. And its effects outlast the fighting, so we use a recursive dynamic model, which tracks each economy year by year against its no-war path: the war-year damage, and the different recovery paths that follow from the two scenarios. The repair of damaged plant is not modelled but imposed, as a path of output and export cuts taken from the data and our assumptions (Section 4.3); what the model adds is how investment and the capital stock respond along that path.

The second is a short-run price model for energy and consumer prices. Our CGE model makes crude oil only about 9% dearer for buyers in 2026, against a measured rise of about two thirds. This is expected, because CGE models are typically ill-suited to capturing short-term price swings: buyers and producers can switch suppliers much more quickly than they could in the real world. Validation studies find that energy-oriented CGE models respond too elastically and therefore underestimate the short-run swings in oil prices seen in the data (Beckman, Hertel and Tyner, 2011), and econometric estimates of short-run oil demand and supply elasticities are far lower than those used in CGE models (Caldara, Cavallo and Iacoviello, 2019; Baumeister and Hamilton, 2019). We therefore estimate energy and consumer prices with a separate short-run price model (Section 3.6): a world energy market calibrated to measured 2026 prices and published short-run elasticities (Kilian and Murphy, 2014; Caldara, Cavallo and Iacoviello, 2019), with consumer prices from local-projection estimates of past oil price pass-through (Jordà, 2005; Känzig, 2021) and an input-output cost pass-through calculation (Miller and Blair, 2009). The energy and consumer price results in this paper come from this model; all other results, including GDP, welfare and the terms of trade, come from the CGE model.

The paper makes three contributions. (i) It models the main channels of the conflict's disruption together, not the strait alone, with shocks calibrated from measured 2026 data, country by country and product by product, as far

as possible. Each shock is applied to what the data measure: production for crude oil, refining and aluminium, and exports for LNG, urea and Iran's oil. Where the data run out, we make assumptions, which are clearly marked. (ii) It introduces a short-run price model, built on econometric estimates, to pair with the CGE model's results, because an annual CGE model adjusts too quickly to capture the price spike. (iii) It measures the cost of a longer war, both in the short run and in the years after the fighting, as the difference between the two scenarios in each year, with each scenario measured against the no-war baseline.

Section 2 reviews related work. Section 3 describes the CGE model, the data and the short-run price model, and Section 4 the scenarios and how the shocks enter the model. Section 5 presents the results, including real GDP as well as energy and consumer prices. Section 6 tests the results with a range of sensitivities: model extensions that add different mechanisms (sticky wages, energy substitution and a post-war risk premium on Gulf investment), and applying the oil and refining shocks to exports instead of production; it also compares the results with outside estimates. Section 7 discusses the limitations and the policy implications, and Section 8 concludes. The appendix gives the sector mapping, full results, the risk premium paths, full results for the shock to exports, a rough check against IMF forecast revisions, baseline growth, refinements to the price pass-through estimate, how each shock value is built, and an earlier run of the longer war under the shock to exports.

2. Related literature

Three strands of work are relevant to this paper: studies of oil supply shocks in general, model-based studies of a Hormuz closure, and estimates made during the 2026 war.

Oil supply shocks. The macroeconomic literature separates supply disruptions from demand-driven price rises and finds that their effects on output differ (Kilian, 2009; Hamilton, 2009). Earlier work on chokepoints found that the damage to importers depends as much on the policy response, above all on releases from strategic stocks, as on the size of the shortfall (US Congress Joint Economic Committee, 2007; Komiss and Huntzinger, 2011). Our model has no strategic stocks, so it leaves out the cushion that stock releases give importers, which on its own would make importer losses larger in the model than in practice (Section 7.1).

Model-based Hormuz studies. The closest peers are two CGE studies from the Kiel Institute and WIFO, both using the KITE quantitative trade model (Hinz, Mahlkow and Wanner, 2025) on GTAP 11 data (Hinz et al., 2026; Pokhrel, 2026). They model the closure as a large rise in iceberg trade costs on Gulf energy exports (a cost multiplier of 10) and report short-run world price rises of 12.1% for crude, 8.3% for refined products and 7.9% for gas, with Austria's welfare 0.15% lower (Pokhrel, 2026). An agent-based maritime transport model finds that simulated shipping disruption stays limited for closures of two weeks or less and grows disproportionately beyond about four weeks, with a 56-day closure causing more than twice the disruption of a 28-day one (Klimek et al., 2026), and a multi-channel maritime disruption model puts Japan's loss from a closure at about 2.4% of GDP (Veetil and Vemmarath, 2026). The European Central Bank uses input-output scenarios to show that an energy disruption can lower GDP and keep inflation high after activity recovers (ECB, 2026). We found no published study of a Hormuz closure or of the 2026 Gulf conflict that uses the standard GTAP or GTAP-RD model. The Kiel and WIFO studies also treat the strait as the whole shock, whereas we add the measured losses of Gulf production and exports.

Estimates during the war. The Dallas Fed estimated in March 2026 that a closure lasting one or two quarters would lower world GDP growth over 2026 (fourth quarter on fourth quarter) by 0.2 to 0.3 percentage points, and a closure of three quarters by 1.3 points (Kilian, Plante and Richter, 2026). Goldman Sachs put the potential fall in 2026 real GDP at close to 10% for the hardest-hit economies, Qatar and Kuwait, if Gulf energy output stayed at its March level until the end of April and then recovered over two months (Goldman Sachs Research, 2026); Allianz and Oxford Economics published similar scenario ranges (Oxford Economics, 2026; Allianz Research,

2026). In its extended-disruption scenario, with the strait largely closed until the end of 2026, Wood Mackenzie projected a much larger hit to the EU: GDP 1.5% lower in 2026 and 0.5% lower in 2027 (Wood Mackenzie, 2026). A study of Gulf exporters' revenues showed that Kuwait's export earnings fell almost to zero in March, since Kuwait and Qatar have no bypass route (Krane and Alexander, 2026). In October the IMF cut its 2026 growth forecasts to −15.6% for Qatar, −16.7% for Kuwait, −16.0% for Iraq, −3.3% for Saudi Arabia and −3.9% for the UAE (IMF, 2026c).

This paper adds to that work a dynamic, multi-region CGE estimate that is calibrated to measured 2026 flows and follows the effects to 2030. It also models what a hypothetical renewed round of fighting in 2027 would add, a question of immediate concern to policymakers now that talks have stalled, and one that none of these studies addresses.

3. Model and data

3.1 The core model

The model is the standard GTAP model (Hertel, 1997), version 7 (Corong et al., 2017), solved year by year with the GTAP recursive dynamic (GTAP-RD) extension (Aguiar, Corong and van der Mensbrugghe, 2019). GTAP is a global CGE model in which firms in each region minimise costs, a regional household allocates income between private consumption, government spending and saving, and goods are traded bilaterally. Imports are imperfect substitutes for domestic goods and for each other by source, following Armington (1969). International shipping is supplied by a global transport sector, so a rise in shipping costs on a route raises the price buyers pay above the price exporters receive.

GTAP-RD adds time. Each year's capital stock is last year's stock less depreciation plus investment. Investment in each region responds to the gap between the expected and the target rate of return, so a region where returns fall attracts less investment and its capital stock falls behind the baseline (Aguiar, Corong and van der Mensbrugghe, 2019). The model runs in annual steps from 2022 to 2030. Results are therefore yearly averages: a price spike that lasts two months shows up as a smaller rise in the annual price.

We coded GTAP-RD (Aguiar, Corong and van der Mensbrugghe, 2019) into Julia ourselves, on top of Ivanič's Julia code for the standard GTAP model (Ivanič, 2025), and solve it with the Ipopt solver and the MUMPS linear solver (Wächter and Biegler, 2006; Amestoy et al., 2001).

3.2 Extensions

The central results use the basic GTAP-RD model. We coded each of these extensions into Julia ourselves, on top of our GTAP-RD code (Section 3.1). Section 6 adds the three extensions below one at a time, and sticky wages in combination with GTAP-E and with the risk premium. None of them changes the headline results much (Section 6.1).

- **Sticky wages.** Real wages adjust to unemployment with a lag, so a slump raises unemployment instead of being absorbed by lower wages. The mechanism follows Dixon and Rimmer (2002); the adjustment speed of 0.5 is our assumption. Standard CGE models have no unemployment, because wages adjust at once; with sticky wages the war creates a short-term rise in unemployment, which makes war-year losses larger (world GDP in 2026 is 0.66% below its no-war path instead of 0.32%). In the long run wages adjust and unemployment returns to its long-run level, a gap of zero against the baseline.
- **Energy substitution (GTAP-E).** Firms can substitute between energy and capital and between fuels, following Burniaux and Truong (2002) and McDougall and Golub (2007). This slightly narrows Gulf war-year losses. Firms can switch between fuels, so in the Gulf, gas that can no longer be exported is used more

at home, in power, transport and industry; gas output, and the workers and capital in it, fall less. Results for importers barely change.

- **Post-war risk premium.** Investors require a higher return on capital in the Gulf during and after the war. The size comes from changes in sovereign credit default swap (CDS) spreads (AGBI, 2026), scaled to an equity premium with Damodaran's ratio of 1.52 (Damodaran, 2026), and from IMF evidence on conflict and capital (IMF, 2025a, 2026b). How fast it fades is our assumption. This lowers investment in the Gulf from the war onwards, so capital rebuilds more slowly; the effect is small for the Gulf Arab exporters and largest for Iran, where the premium is largest and fades slowest.

3.3 Data and aggregation

The database is the Matra Open CGE Database, beta release v0.5.5, with base year 2022 (Matra, 2026). It is built from the OECD Inter-Country Input-Output tables (OECD, 2025) and covers 51 sectors (the 50 OECD sectors with crude oil and natural gas split). For this study it is aggregated to 12 regions and 12 sectors (Table 1); the two columns are separate lists. Appendix A.1 gives the full mapping of each of the database's 167 regions and 51 sectors.

Table 1. Aggregation

Regions (12)	Sectors (12)
Qatar	Crude oil
Saudi Arabia	Natural gas
United Arab Emirates	Refined products
Iraq, Kuwait and Bahrain (one group)	Coal
Iran	Electricity
Egypt	Aluminium and other non-ferrous metals
China	Chemicals and fertilisers
India	Water transport
Japan and Korea (one group)	Other transport
European Union	Agriculture and food
United States	Other manufacturing
Rest of world	Other services

Iraq, Kuwait and Bahrain are grouped because none has much pipeline capacity around the strait: Iraq's Kirkuk–Ceyhan line carried only about 200,000 to 230,000 barrels a day in 2026 (S&P Global Commodity Insights, 2026). Japan and Korea are grouped as the two large Asian importers with similar exposure. Both groupings are our choices. In this paper "the Gulf" means the economies around the Persian Gulf: Qatar, Saudi Arabia, the UAE, Iraq, Kuwait, Bahrain and Iran; "the Gulf Arab exporters" leaves out Iran.

3.4 Baseline

The baseline runs from 2022 to 2030 without the war. It follows the SSP2 "middle of the road" path: working-age population from the IIASA Wittgenstein Centre projections (IIASA, 2024; Wittgenstein Centre, 2023), and labour productivity set so that each region's real GDP follows the SSP2 GDP path (IIASA, 2024; Wittgenstein Centre, 2023). Capital accumulates from investment. No new trade or tariff policy is added. Every result in this paper is the scenario minus this baseline, in the same year.

3.5 CGE model-wide specification

Table 2. Specification used in every GTAP-RD run

Item	Setting	Source
Model	GTAP v7 with GTAP-RD dynamics, annual steps 2022 to 2030	(Corong et al., 2017; Aguiar, Corong and van der Mensbrugghe, 2019)
Data	Matra Open CGE Database v0.5.5-beta, 2022	(Matra, 2026; OECD, 2025)
Baseline	SSP2 population and GDP to 2030; no policy changes	(IIASA, 2024; Wittgenstein Centre, 2023)
Elasticities	From the Matra database's parameter file, benchmarked to GTAP 12, except the gas trade elasticities, which are lowered for this study (Section 4.4)	(Matra, 2026; Aguiar et al., 2025)
Natural-resource supply elasticity	0.5	Assumed
Closure	Standard GTAP-RD closure: investment follows expected returns; the regional household balances its budget	(Aguiar, Corong and van der Mensbrugghe, 2019)
Solver	Ipopt with MUMPS; no-shock run must match the baseline to 1e-8	(Wächter and Biegler, 2006; Amestoy et al., 2001); assumed tolerance

3.6 A short-run price model

The CGE model is annual and lets buyers and producers substitute away from energy within the year, so it understates how far energy prices rose: it makes crude oil only about 9% dearer for buyers in 2026. We therefore take price results from a separate short-run price model: a world energy market calibrated to measured 2026 prices, plus input-output cost pass-through.

World energy prices. For 2026 the annual average prices of Brent crude, Asian LNG (the Japan import price) and European gas are measured to September; for the rest of the year oil follows the EIA's October forecast and gas is held at its September level (EIA, 2026; IMF, 2026d). The no-war baseline for oil is the EIA's pre-war February 2026 forecast, $58 a barrel in 2026 and $53 in 2027 (EIA, 2026); for gas it is the January–February 2026 level, with and without the usual seasonal pattern (assumed). If the war ends in 2026, the 2027 oil price is the EIA's October forecast.

If fighting continues, we price the extra loss of Gulf oil in 2027 (Section 4.3) with our own estimate of how the market responded in 2026. In 2026 the world lost 6.7 million barrels a day of supply; about 4.35 million of this was covered from stocks (about 3.0 million in planned stock-building that did not happen and about 1.3 million in actual draws), and the rest by lower use (EIA, 2026). Dividing this total response by the price rise gives a responsiveness of 0.126; following Kilian and Murphy (2014), we count stock changes as part of the market's response to price. The central case assumes that stocks can be drawn in 2027 as they were in 2026. The low end uses the published short-run responsiveness of 0.16 (Caldara, Cavallo and Iacoviello, 2019); Baumeister and Hamilton (2019) also find low short-run responsiveness. The 2027 loss, 10.7 million barrels a day, is larger than any past oil shock, so the estimate is applied beyond the range it was measured on. If stocks ran short, prices would rise further, potentially up to a level that forces demand to collapse, which this model cannot represent, so we give no numerical high case and the $140 figure should be read as indicative. Gas prices in 2027 follow the lost Qatari LNG supply, priced in the same way with the responsiveness measured in 2026, halved and doubled for the range; Asian LNG is taken to move with European spot gas, as both trade in one spot LNG market (assumed).

Consumer prices. Our headline consumer price figures come from a historical estimate: local projections (Jordà, 2005) of each economy's consumer price level on the oil price, instrumented with the oil supply news

shocks of Känzig (2021) and estimated over 1992–2019 as cumulative multipliers (Ramey and Zubairy, 2018), on monthly consumer price data (OECD, 2026). This gives the total effect, within 24 months, of a typical supply-driven oil price rise, including second-round effects and the usual policy response, such as the government support typical in past oil shocks. We feed the monthly path of the Brent gap through each economy's estimated response, for the United States, the euro area, the United Kingdom, Canada and, with a caveat for three consumption-tax rises, Japan. The sample ends in 2019 to avoid the break in relative prices after Covid (assumed); the sample to 2025, which includes the 2021–23 inflation surge, is shown as a high-inflation case.

For comparison, we also report the pass-through crudely measured so far in 2026: the ratio of the measured consumer price gap to the oil price gap from March to September 2026 (US Bureau of Labor Statistics, 2026; Eurostat, 2026), held at that speed (assumed). It does not control for other influences on prices.

Separately, we look at an extreme case: the full first-round effect for all economies. We pass world energy prices through the input-output tables of the Matra database (Matra, 2026) as a cost push (Miller and Blair, 2009, ch. 2), with wages and capital returns fixed and no substitution between inputs. Each economy pays the energy prices it actually faces: importers their regional gas hub price, Gulf economies their administered home prices, and buyers of Gulf cargoes the Strait of Hormuz shipping cost of Section 4.2 (assumed). It has no lags, and it leaves out substitution and cuts in demand, which would lower prices, and wage feedback, which would raise them.

4. Scenario design

4.1 Two war paths

Both scenarios share the same 2026, built from measured data. They differ only in what follows.

- **War ends in 2026.** This is the current situation: strikes have largely stopped since September, and in this path the fighting does not resume. Gulf oil output recovers through 2027 along the US Energy Information Administration's (EIA) forecast path (EIA, 2026). Qatar's LNG exports stay below normal until 2029, because 17% of its capacity was damaged and takes about three years to repair (QCintel, 2026).
- **War continues into 2027.** Six more months of fighting in 2027, with lost output assumed to be at the worst level of spring 2026, and output for the rest of the year held at the damaged level. Strait shipping costs are higher, and Iran's exports are cut by 80%. The war ends after 2027. The longer war leaves further damage, and recovery is delayed until the fighting stops (the damage rule is set out in Appendix A.8). Oil and refining are repaired over three years (Qatar's crude follows LNG), the rule of thumb for rebuilding oil production capacity in war-hit exporters, with past recoveries taking two to four years (Alhajji, 2003). LNG is repaired over five years, the long end of QatarEnergy's three-to-five-year estimate (QCintel, 2026), because a longer war would likely cause greater overall damage.

The cost of a longer war is the second scenario minus the first, year by year.

4.2 How the shocks enter the model

The 2026 data record lower production for some goods and lower exports for others, and the model is told to hold fixed whichever one the data measure.

- **Oil and refining: shock to production.** The EIA and Kpler data measure crude and refinery output, so Gulf output of crude oil and refined products is fixed at its measured cut. The sector's productivity adjusts so that output hits the target. The lost output is lost capacity: no one collects a rent on it, and idle fields and

refineries show up directly in GDP. The model then decides how much of the fall lands on exports and how much on domestic use.

- **LNG, urea and Iran: shock to exports.** For Qatar's LNG, Gulf urea and Iran's crude and products the data are exports, so export volumes are fixed. A trade-cost wedge on those flows (the import-augmenting technical change variable of standard GTAP v7 (Corong et al., 2017)) adjusts until buyers take exactly that quantity. Buyers then pay for the full shipment but receive only the target quantity, and the difference is a loss that no one collects, as if the goods were lost in transit. In the central case this loss is small: about $25bn in 2026, 0.03% of world GDP, and at most 0.10% of GDP for any economy (the UAE, mostly on its pipeline gas from Qatar). For LNG this treatment is our choice: the 2026 data are cargo counts, and the model's gas sector also covers the Dolphin pipeline and gas used at home, so an output cut could not target LNG alone. It has costs. Buyers of Qatari LNG receive only about half of each cargo they pay for in 2026, so they face an effective cut of about 85% rather than the measured 69%; the lost value is about $10bn in 2026 and, in the longer war, $13bn in 2030, when all of it is LNG. Qatar's gas workers and capital also move into other industries within the year instead of standing idle, which likely understates Qatar's GDP loss. A version with LNG as a shock to production is being tested and will be reported in an update.
- **Aluminium: shock to production**, because the metal was never made: smelters were hit, ran short of gas, or could not ship.
- **The strait: a cost per unit.** Gulf crude, refined products and LNG shipped through Hormuz carry a dollar add-on per barrel and per million British thermal units (MMBtu), derived from war-risk insurance rates (S&P Global, 2026). The premium, quoted as a share of a ship's hull value per voyage, is converted to a cost per unit of cargo using typical vessel values and cargo sizes (our calculation), and enters the model as an added shipping cost. Saudi Arabia (42% of its crude) and the UAE (55%) ship part of their exports by pipeline around the strait (IEA, 2026b), and the add-on does not apply to that share. Iraq, Kuwait and Bahrain get no bypass share, so the small Iraqi flow through Ceyhan (S&P Global Commodity Insights, 2026) carries the strait cost in the model, which slightly overstates their shipping cost (assumed simplification). Their measured crude output loss already includes the Ceyhan barrels. Pipeline gas from Qatar to the UAE (Dolphin) is held at its pre-war volume through the same trade-cost wedge, so the UAE in effect receives only about a quarter of the gas it pays for; the lost value is small, about $0.35bn in 2026.

Idle plant. In the central case, crude oil and refining output in the Gulf is set to the measured or assumed cut, and the model meets that target through a fall in the sector's productivity. The sector therefore keeps most of its workers and capital while producing less, much as damaged or shut-in plant does in the short run, when its capital cannot move to other uses. This is how the model applies an output cut, and it makes Gulf GDP losses, Qatar's in particular, larger than they would be if those workers and that capital were released to other sectors. The shock-to-exports sensitivity (Section 6.2) shows the other end of the range.

This is our central case, which we call the shock to production. Section 6.2 reports the alternative, the shock to exports, in which the oil and refining cuts enter as export cuts instead.

4.3 Shocks

All shocks are % changes from the baseline in that year, unless marked $ (added cost per unit). Each row says whether it cuts output or exports. Appendix A.8 shows how each yearly value is built, with its source, and marks which parts are assumed.

Table 3. Shocks: war ends in 2026

Shock	Enters as	2026	2027	2028 onward	Source
Crude oil: Qatar / Iraq, Kuwait, Bahrain / Saudi Arabia / UAE	Output cut	−53 / −33 / −15 / −5	−24 / −7 / −4 / 0	Qatar −17 in 2028 (LNG damage held, assumed); others 0	EIA STEO, Oct 2026 (EIA, 2026)
Refined products: Saudi Arabia / UAE / Qatar / Iraq, Kuwait, Bahrain	Output cut	−20 / −21 / −71 / −33	−4 / −5 / −17 / −7	0	Kpler, IEA (IEA, 2026a)
Iran crude and products	Export cut	−67 (−80% from March, assumed)	0	0	Kpler, Vortexa (Reuters, 2026b, 2026c)
Qatar LNG	Export cut	−70	−24 (EIA Qatar oil path as a proxy)	−17 in 2028 (17% damage held, assumed); 0 from 2029	AXSMarine, Kpler (20Cube, 2026; Cyprus Mail, 2026); QatarEnergy (QCintel, 2026)
Aluminium: UAE / Bahrain / Qatar	Output cut	−32 / −27 / −33	−2 / −10 / −25	0	EGA, Alba, Hydro (EGA, 2026); 2027 for Bahrain and Qatar assumed; for the UAE and Qatar the cut applies to the whole non-ferrous metals sector (Section 6.1)
Urea: Saudi Arabia / Qatar / UAE / Bahrain	Export cut	−38 / −35 / −61 / −72	0	0	Importers' customs data (UN Comtrade, 2026); Sep–Dec assumed
Strait cost on Gulf crude, refined products and LNG through Hormuz	$ per unit	$3.9/bbl; $4.7/MMBtu	$0.2; $0.25 (assumed)	fades in a straight line to zero by 2030 (assumed)	War-risk insurance (S&P Global, 2026)

Table 4. Shocks: war continues into 2027 (2026 as in Table 3)

Shock	Enters as	2027 (six months of fighting)	2028 / 2029 / 2030	Basis	Source
Crude oil: Saudi Arabia	Output cut	−27	−7 / −3 / 0	Half the year at the worst 2026 month, half at the damaged level (twice the 2027 shortfall if the war ends in 2026, at least 10%), plus a pipeline outage (assumed); damage repaired over three years (assumed)	(EIA, 2026; Alhajji, 2003)
Crude oil: Iraq, Kuwait, Bahrain	Output cut	−44	−10 / −5 / 0	Same rule	(EIA, 2026; Alhajji, 2003)
Crude oil: UAE	Output cut	−34	−7 / −3 / 0	Same rule, with a pipeline outage (assumed)	(EIA, 2026; Alhajji, 2003)
Crude oil: Qatar	Output cut	−60	−27 / −20 / −14	Worst month, then the LNG damage path	(EIA, 2026)
Refined products: UAE / Iraq, Kuwait, Bahrain / Qatar / Saudi Arabia	Output cut	−21 / −31 / −62 / −20	UAE and Saudi Arabia −7 / −3 / 0; Iraq, Kuwait, Bahrain −10 / −5 / 0; Qatar −22 / −11 / −3	Same rule as crude: half the year at the April 2026 low, half at the damaged level (twice the first scenario's 2027 shortfall, at least 10%), repaired over three years (assumed)	(IEA, 2026a)
Iran crude and products	Export cut	−80	0	Blockade for the period of fighting (assumed)	(Reuters, 2026c)
Qatar LNG	Export cut	−65	−27 / −20 / −14	April 2026 level (−96%) for six months; damage doubled to 34% of capacity (assumed; 17% measured), repaired over five years, the long end of QatarEnergy's three to five, as a longer war would likely cause greater damage	(20Cube, 2026; QCintel, 2026)
Aluminium: Bahrain / Qatar / UAE	Output cut	−40 / −40 / −33	2028: Bahrain −10, Qatar −25; then 0	Plants hit again; restarts assumed	(EGA, 2026)
Urea: Saudi Arabia / Qatar / UAE / Bahrain	Export cut	−32 / −21 / −37 / −43	0	March–August 2026 level for six months	(UN Comtrade, 2026)
Strait cost	$ per unit	$5.9/bbl; $7.0/MMBtu	$0.2 / 0.13 / 0.07 per bbl; $0.25 / 0.17 / 0.08 per MMBtu (fading to zero, assumed)	Peak war-time insurance held all year (assumed, top of the range)	(S&P Global, 2026)

4.4 Assumptions specific to these scenarios

Table 5. Scenario assumptions

Item	Setting	Source
Gas trade elasticities	A fifth of the standard GTAP values (domestic–import 3.44, between sources 6.88), since most gas moves on fixed routes	Assumed; standard values in Aguiar et al. (2025)
Dolphin pipeline (Qatar to UAE gas)	Held at capacity	Assumed
Iran's cut	−80% rather than −100%, allowing for untracked flows	Assumed, from tracked loadings near zero (Reuters, 2026d; Vortexa, 2026)
Rule for six more months of war	Half the year at the worst 2026 month, half at the damaged level (twice the 2027 shortfall if the war ends in 2026, with a 10% floor for oil)	Assumed
Repair paths	Damage doubled; three years (oil, refining), five years (LNG)	(QCintel, 2026; Alhajji, 2003); doubling assumed
Qatar LNG in 2027, first scenario	EIA's Qatar oil path (−24%), since EIA does not forecast LNG	(EIA, 2026), proxy
Strait cost in 2026	Based on the top of the reported insurance range in March–May, so an upper bound	(S&P Global, 2026)
Strait cost after the war	$0.2/bbl and $0.25/MMBtu in the first year after the fighting, fading in a straight line to zero over three years	Assumed; no primary source

5. Results

All results in this section are from the central case (shock to production, Section 4.2) and the basic GTAP-RD model. Each figure is the gap from the no-war baseline in that year, in %.

> **How to read the numbers.** Every result compares two worlds in the same year: one with the war and one without it. When we say Qatar's GDP is −30% in 2026, we mean Qatar's real GDP in 2026 is 30% lower than it would have been without the war. It does not mean Qatar's economy shrank by 30% from the year before. Growth from other causes continues in both worlds, so a country can be below its no-war path and still be growing.

5.1 The war year, 2026

The Gulf carries most of the loss, and the economies with little or no route around the strait are furthest below their no-war path. Qatar's real GDP in 2026 is 30.2% lower than it would have been without the war, and that of Iraq, Kuwait and Bahrain (modelled as one group) 19.3% lower (Table 6). Saudi Arabia (6.7%) and the UAE (4.8%), which can send part of their crude by pipeline, are far less affected. Iran's GDP is 3.8% lower.

Table 6. Real GDP: % difference from what it would have been without the war, in that year

Region	2026 (both scenarios)	2027: war ends in 2026	2027: war continues	2030: war ends in 2026	2030: war continued
Qatar	−30.2	−10.7	−28.6	−3.3	−8.2
Iraq, Kuwait, Bahrain	−19.3	−4.5	−24.3	−0.95	−2.1
Saudi Arabia	−6.7	−1.7	−10.3	−0.24	−0.62
UAE	−4.8	−0.38	−9.9	−0.10	−0.55
Iran	−3.8	−0.02	−4.8	−0.13	−0.26
India	−0.29	−0.15	−0.42	−0.05	−0.17
Japan and Korea	−0.17	−0.11	−0.23	−0.04	−0.12
China	−0.10	−0.04	−0.14	−0.03	−0.07
European Union	−0.10	−0.06	−0.14	−0.03	−0.07
Egypt	0.02	0.05	0.02	0.01	0.03
United States	0.04	0.01	0.05	0.00	0.00
Rest of world	0.06	0.02	0.10	0.00	0.01
World	−0.32	−0.09	−0.43	−0.03	−0.08

Central case, basic GTAP-RD.

Gulf households lose more than GDP shows in Qatar. Utility per person, our welfare measure (the regional household's real income per person, spent on private consumption, government services and saving (Corong et al., 2017)), is 42.7% lower in Qatar in 2026, 15.9% in Iraq, Kuwait and Bahrain, 6.9% in Iran, 4.8% in Saudi Arabia and 2.5% in the UAE. Qatar's terms of trade fall by 6.7% and Iran's by 14.5%. For the oil exporters that keep shipping, higher oil prices raise the terms of trade (Saudi Arabia +6.6%, Iraq, Kuwait and Bahrain +9.8%), which softens their welfare loss. The Gulf's exports of crude, gas, refined products and chemicals in 2026 are about $348 billion lower than without the war, valued at baseline prices.

Importers lose more in welfare than in GDP. India's GDP is 0.29% lower and that of Japan and Korea 0.17% lower, but their welfare per person falls by 1.1% and 0.81%, because they pay more for imported energy (India's terms of trade fall 2.7%). China and the EU lose about 0.1% of GDP. The United States, a net energy exporter, gains slightly. World GDP is 0.32% lower.

Producers outside the Gulf make up part of the shortfall. They raise output of crude, gas and refined products, by about $107 billion in the United States and $260 billion in the rest of the world in 2026, valued at baseline prices; refiners in Japan and Korea produce less. These gains are likely overstated, because the model replaces lost Gulf supply within the year, while in 2026 most of the gap was met by stocks and lower demand (Section 7.1). The CGE model's annual energy price changes are much smaller than the price rises measured in 2026, so price results are taken from the short-run price model instead (Section 5.4).

5.2 The cost of a longer war

Six more months of fighting keep most Gulf economies as far below their no-war path in 2027 as in 2026, or further. If the war continues, Qatar's GDP in 2027 is 28.6% lower than without the war, against 10.7% if it ends in 2026 (Table 6). Iraq, Kuwait and Bahrain are 24.3% lower instead of 4.5%, Saudi Arabia 10.3% instead of 1.7%, and the UAE 9.9% instead of 0.38%. World GDP is 0.43% lower instead of 0.09%. Investment falls with GDP: in 2027 it is 37% lower in Qatar and 28% lower in Iraq, Kuwait and Bahrain than without the war.

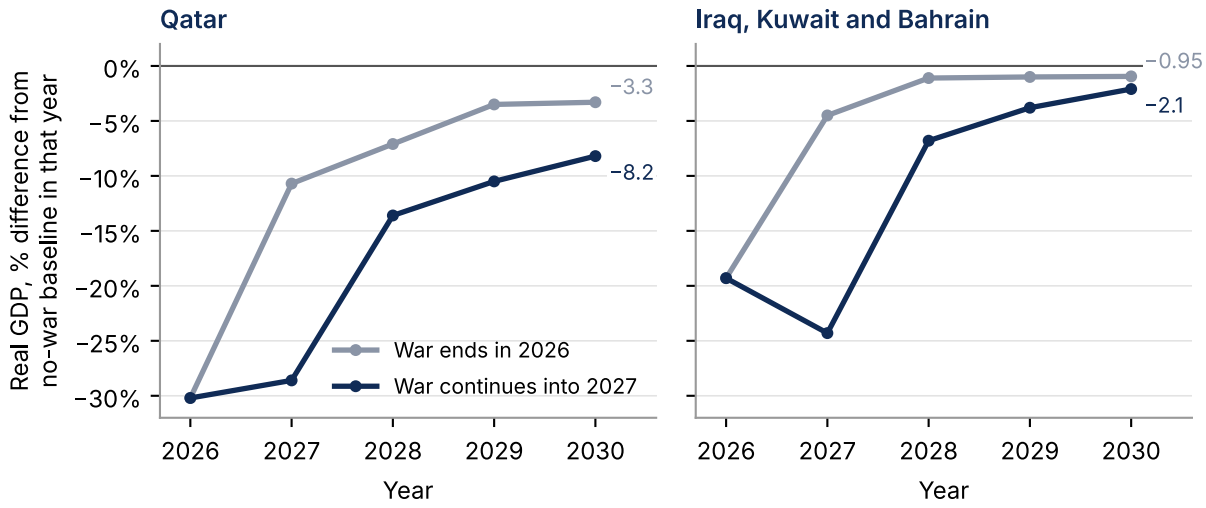


Figure 1. Real GDP of the most affected Gulf economies, % difference from the no-war baseline in each year, 2026 to 2030. Source: Matra model runs, shock to production (central case), basic GTAP-RD.

5.3 The long-term cost of a longer war

Our headline measure of what extra fighting costs is the difference between the two scenarios in a single later year, 2030. It shows how much lower GDP is in 2030 because the war ran six more months. It is the difference of two gaps in the same year, in percentage points, never a sum over years.

Table 7. Extra cost of six more months of war: GDP if the war continues minus GDP if it ends in 2026, percentage points

Region	In 2027	In 2030
Qatar	−17.9	−4.9
Iraq, Kuwait, Bahrain	−19.8	−1.2
Saudi Arabia	−8.7	−0.38
UAE	−9.5	−0.45
Iran	−4.8	−0.13
India	−0.26	−0.12
Japan and Korea	−0.13	−0.08
China	−0.10	−0.04
European Union	−0.08	−0.04
Egypt	−0.03	0.02
United States	0.04	0.00
Rest of world	0.08	0.01
World	−0.34	−0.05

Differences use unrounded values. Central case, basic GTAP-RD.

The Gulf is still well below its no-war path in 2030. If the war continues into 2027, Qatar's GDP in 2030 is 8.2% lower than without the war, against 3.3% if it ends in 2026. Much of Qatar's lasting gap reflects the assumed repair path: its LNG and crude are still set 14% below baseline in 2030 in the longer war. Outside the Gulf, the 2030 cost of the longer war is under 0.15 points everywhere.

5.4 Energy and consumer prices

The results in this section come from the short-run price model of Section 3.6, not from the CGE model.

A second round of fighting would push energy prices much higher again. In 2026 Brent crude averages $96 a barrel, against $58 with no war, or 66% higher; Asian LNG is 108% higher and European gas 85% higher (Table 8). If the war ends in 2026, Brent averages $84 in 2027 on the EIA's forecast, against $53 with no war, and gas prices are about 23% above their no-war level. If fighting continues, Brent averages about $140 a barrel in 2027, if oil stocks (commercial and government) can be drawn as in 2026; the low end is about $125 to $130, and the price could pass $150 if stocks run short. Gas prices are then about 77% above their no-war level. The gas gaps are probably on the low side, because the no-war baseline is the pre-war winter level.

Table 8. World energy prices, annual average: % difference from the no-war baseline in that year

Price	2026 (both scenarios)	2027: war ends in 2026	2027: war continues
Brent crude (no war: $58 a barrel in 2026, $53 in 2027)	$96, +66%	$84, +58% (EIA forecast)	About $140 if oil stocks (commercial and government) can be drawn as in 2026; low end about $125 to $130; above $150 if stocks run short
European gas	+85% (+64 to +108)	+23% (+11 to +52)	+77% (+33 to +212)
Asian LNG	+108% (+90 to +127)	+23% (+11 to +52)	+77% (+33 to +212)

2026: oil measured January to September, with October to December from the EIA forecast; gas measured to September. The 2026 gas ranges reflect the choice of no-war baseline, the 2027 ranges the price responsiveness. In 2027 Asian LNG is assumed to move with European spot gas. Sources: EIA (2026); IMF (2026d); our calculation.

Consumer prices in the main advanced economies are up to 1.8% above their no-war level in 2026, and about 2% to 4% above it in 2027 if fighting continues. On the historical estimate, the US consumer price level is 1.8% above its no-war path in 2026, the euro area's 0.9%, the United Kingdom's 0.7% and Canada's 1.0% (Table 9). Because pass-through builds up over 12 to 24 months, the gap is still 1.0% to 2.0% in 2027 even if the war ends in 2026. If fighting continues and Brent averages about $140 a barrel, it is 3.9% in the United States, 2.3% in the euro area, 2.2% in the United Kingdom and 2.1% in Canada. That case lies far outside the oil price rises in the estimation sample, so it is an extrapolation, and the 90% ranges are wide. If pass-through returned to its 2021–23 speed, the gaps would be larger (the high-inflation case). These are gaps in the price level, not inflation rates, and each year is a separate comparison with the no-war baseline: the 2026 and 2027 figures are not added together.

Table 9. Consumer price level: % difference from the no-war baseline in that year

Region	2026	2027: war ends in 2026	2027: war continues	High-inflation case (2026 / 2027 war ends / 2027 war continues)
Historical estimate, 1992–2019 (90% range)				
United States	1.8 (1.3 to 2.5)	2.0 (1.0 to 3.9)	3.9 (2.5 to 6.7)	2.4 / 3.7 / 6.5
Euro area	0.9 (0.7 to 1.2)	1.3 (0.7 to 1.9)	2.3 (1.4 to 3.2)	1.4 / 3.1 / 4.7
United Kingdom	0.7 (0.2 to 1.3)	1.4 (0.4 to 3.7)	2.2 (0.7 to 5.2)	1.2 / 3.3 / 4.8
Canada	1.0 (0.7 to 1.5)	1.0 (0.4 to 1.6)	2.1 (1.3 to 3.2)	1.7 / 2.9 / 4.8
Japan (see note)	0.6 (0.0 to 1.1)	1.5 (0.2 to 3.4)	2.2 (0.2 to 4.7)	0.9 / 3.1 / 4.2
Pass-through measured in 2026				
United States	1.0	0.88	2.6 (low end 2.1)	–
Euro area	1.1	0.98	2.8 (low end 2.4)	–
Full first-round effect, input-output				
World	2.8	1.8	5.6	–
United States	1.2	0.88	3.1	–
European Union	3.9	2.2	6.6	–
Japan and Korea	4.8	2.6	7.9	–
China	2.0	1.4	4.2	–
India	4.7	3.3	9.9	–

Historical estimate: local projections on Känzig (2021) oil supply shocks, 1992–2019, with 90% bootstrap ranges; the high-inflation case uses the sample to 2025. 2027 war continues: Brent about $140 a barrel if oil stocks (commercial and government) can be drawn as in 2026, held through 2027 (assumed), far outside the estimation sample. Japan: the sample includes consumption-tax rises; controlling for them lowers its 2027 figures (Appendix A.7). Measured pass-through: March–September 2026 (US Bureau of Labor Statistics, 2026; Eurostat, 2026). Full first-round effect: Matra database v0.5.5, central oil and gas prices.

The three methods answer different questions. The historical estimate is the total effect of a typical supply-driven oil price rise within 24 months, not an estimate specific to the Gulf. The pass-through measured in 2026 gives a similar picture for the euro area, but a lower one for the United States (2.6% against 3.9% in 2027 if fighting continues). Its main weakness is that many other things also moved consumer prices in 2026: support policies holding prices down, gas and electricity prices moving differently from oil (above all in Europe), exchange rates, central bank responses and weaker confidence, and food, tariff and wage changes that would have happened anyway; the no-war trend is itself an estimate, and the measure covers only seven months. We therefore use it as a check on the historical estimate, not as the central estimate. The full first-round effect shows where the pressure falls across all economies: it is largest for the energy importers of Asia and for Europe, at 9.9% in India, 7.9% in Japan and Korea and 6.6% in the EU in 2027 if fighting continues. It runs well above what has been measured so far: at March–September 2026 prices it puts the euro area 4.0% above its no-war path, against 1.3% measured, and the United States 1.4% against 1.1%. Appendix A.7 tests six refinements of the historical estimate; none changes the core results.

6. Sensitivity and comparison

6.1 Model extensions

Sticky wages matter most for the war year; Qatar's headline cost of a longer war hardly moves. Table 10 repeats the war-year results under each extension of Section 3.2, alone and in two combinations. Table 11 does the same for the headline measure, the difference between the two scenarios in 2030.

With sticky wages, part of the war's slump shows up as unemployment instead of lower wages, and war-year losses are larger everywhere. World GDP in 2026 is 0.66% lower than without the war instead of 0.32%, India's 1.3% lower instead of 0.29%, and Qatar's 35.9% lower instead of 30.2%. Energy substitution (GTAP-E) works the other way in the Gulf: Qatar's 2026 gap narrows to 26.0% and Saudi Arabia's to 6.1%, while importer results barely change. With both together, Gulf results are close to the basic model except for Iraq, Kuwait and Bahrain (21.6% instead of 19.3%), and importer losses are larger (world 0.51%).

At its central size, the post-war risk premium on Gulf investment moves the results of the Gulf Arab exporters by at most 0.15 point in any year. Its main effect is on Iran, where the premium is largest and fades slowest (Appendix A.3): if the war ends in 2026, Iran's GDP in 2030 is 0.65% below its no-war path instead of 0.13%, and 0.18% to 0.78% across the low and high paths. At the high size, Iraq, Kuwait and Bahrain end 2030 1.6% below their no-war path instead of 0.95%.

The headline holds for Qatar. In every specification, a longer war leaves Qatar's GDP in 2030 between 4.7 and 4.9 points lower than if the war ends in 2026 (Table 11). For the other Gulf Arab exporters it depends more on the model: sticky wages cut the figure for Iraq, Kuwait and Bahrain from 1.2 to 0.58 points and for the UAE from 0.45 to 0.19 points, and for Saudi Arabia it runs from 0.44 points lower to 0.05 points higher, the latter with sticky wages. Outside the Gulf the 2030 cost of the longer war stays within 0.15 points of zero in every specification. Under the shock to exports the 2030 cost for Qatar is smaller, 2.7 points (Section 6.2). We do not report Gulf aluminium output in the years after its shock ends. The model has no smelter capacity limit, so cheap stranded gas lets output jump in a way real smelters could not. A run that capped smelters at pre-war capacity removed the jumps and changed real GDP by at most 0.18 points. For the UAE and Qatar the aluminium cut applies to the whole non-ferrous metals sector. For Qatar the sector is close to its smelter, but the UAE's sector, about $38bn of output, also includes gold and other metal refining, and aluminium may be only about a quarter of it (our estimate, from EGA's output of about 2.7 million tonnes). The UAE's aluminium loss, a 32% cut worth about $12bn in 2026, is therefore probably overstated several times over.

Table 10. Real GDP in 2026 under each model specification, central case: % difference from what it would have been without the war

Region	Basic	Sticky wages	GTAP-E	Sticky wages + GTAP-E	Risk premium	Sticky wages + risk premium
Qatar	−30.2	−35.9	−26.0	−30.1	−30.3	−36.0
Iraq, Kuwait, Bahrain	−19.3	−22.3	−18.7	−21.6	−19.4	−22.4
Saudi Arabia	−6.7	−8.2	−6.1	−7.3	−6.7	−8.2
UAE	−4.8	−5.6	−4.2	−4.9	−4.9	−5.7
Iran	−3.8	−3.8	−3.6	−3.8	−3.9	−4.1
Egypt	0.02	−0.22	0.01	−0.12	0.02	−0.22
India	−0.29	−1.3	−0.35	−0.86	−0.29	−1.3
Japan and Korea	−0.17	−0.73	−0.19	−0.48	−0.17	−0.73
China	−0.10	−0.42	−0.13	−0.26	−0.10	−0.42
European Union	−0.10	−0.47	−0.11	−0.31	−0.10	−0.46
United States	0.04	−0.07	0.02	−0.02	0.04	−0.07
Rest of world	0.06	−0.23	0.01	−0.13	0.05	−0.23
World	−0.32	−0.66	−0.32	−0.51	−0.32	−0.67

The war year is the same in both scenarios. Risk premium = central path.

Table 11. Extra cost of six more months of war in 2030 under each model specification: GDP if the war continues minus GDP if it ends in 2026, percentage points

Region	Basic	Sticky wages	GTAP-E	Sticky wages + GTAP-E	Risk premium	Sticky wages + risk premium
Qatar	−4.9	−4.7	−4.8	−4.8	−4.9	−4.7
Iraq, Kuwait, Bahrain	−1.2	−0.58	−1.3	−0.84	−1.3	−0.65
Saudi Arabia	−0.38	0.05	−0.44	−0.16	−0.39	0.04
UAE	−0.45	−0.19	−0.45	−0.28	−0.46	−0.21
Iran	−0.13	−0.14	−0.10	−0.10	−0.19	−0.22
Egypt	0.02	0.09	0.02	0.05	0.02	0.09
India	−0.12	0.09	−0.12	−0.02	−0.12	0.09
Japan and Korea	−0.08	0.03	−0.09	−0.04	−0.08	0.03
China	−0.04	0.03	−0.04	−0.02	−0.04	0.03
European Union	−0.04	0.02	−0.04	−0.01	−0.04	0.02
United States	0.00	0.03	0.00	0.01	0.00	0.03
Rest of world	0.01	0.07	0.00	0.03	0.01	0.07
World	−0.05	0.03	−0.05	−0.02	−0.05	0.02

Each figure is the gap from the no-war baseline in a given year.

6.2 Shock to exports

In the shock to exports, every shock follows the same path as in the central case, but Gulf crude and refined products enter as export cuts, flow by flow, with refined products measured by export data rather than refinery runs, through the trade-cost wedge described in Section 4.2. Gulf oil fields then keep their workers and capital, which move to other sectors within the year, and buyers lose the shipments as if in transit. With the central risk premium (see below and Appendix A.4), this version gives much smaller war-year losses for the Gulf Arab exporters and larger losses for importers. In 2026 Qatar's GDP is 12.9% below its no-war path, that of Iraq, Kuwait and Bahrain (modelled as one group) 6.5%, Saudi Arabia's 2.4% and the UAE's 2.8%. India's is 1.5% below, that of Japan and Korea 1.3% and Egypt's 0.70%, and world GDP is 0.40% lower. Much of the larger importer loss comes from the method itself. Because the oil cuts now also enter through the trade-cost wedge, buyers pay

for oil they never receive: in 2026 the value lost this way is about $225bn, 0.23% of world GDP, against $25bn in the central case (Section 4.2). It equals about 1.0% of GDP for India, 0.95% for Japan and Korea and 0.6% for Egypt, roughly the whole gap between the two versions for these importers. The larger importer losses in this version therefore mostly reflect how the export cut is modelled, not a different economic outcome.

Longer war. For the shock to exports, the run with the central risk premium of Section 6.1 is the central result, in both scenarios. The basic run of the longer war did not solve in 2029: two very small resource rents, for Iran's coal and for Japan and Korea's crude oil, swung back and forth in the solver. The premium run solved and holds every target exactly in every year. For the war ending in 2026 it differs from the basic run by at most 0.52 points (Iran), and the 2026 figures above are the same in both. With it, a longer war leaves Qatar's GDP in 2030 2.7 points lower than if the war ends in 2026, against 4.9 points under the shock to production with the same premium. The figure is 1.8 points for Iraq, Kuwait and Bahrain (1.3 under the shock to production), 0.65 points for the UAE (0.46), 0.54 points for Saudi Arabia (0.39) and 0.20 points for Iran (0.19). In 2027 the cost of a longer war is 9.1 points for Qatar and 7.3 points for Iraq, Kuwait and Bahrain. Appendix A.9 shows an earlier basic run of the longer war, which did solve but let exports drift from their targets after the fighting; it gives similar results.

Both versions hold every shocked flow exactly at its sourced level in every year, the years after the fighting included. Compared with the previous round of runs, the shock-to-exports results also change because its shock path was aligned with the central case (the UAE in 2026, for example, by about 0.1 point) and because targets are now held exactly after the fighting (Qatar's 2027 gap if the war ends in 2026 widens from 3.7% to 4.8%). The shock to exports is run with every model specification of Section 6.1, except that the low risk premium and sticky wages with the central risk premium solved only for the war ending in 2026.

6.3 Comparison with outside estimates

For Saudi Arabia and for Iraq, Kuwait and Bahrain our central case is close to the gap implied by the IMF's forecast revisions; for Qatar it is larger, and for the UAE and Iran smaller. As a rough check (Appendix A.5), we compare our 2026 results with the gap implied by the IMF's October 2026 forecasts (IMF, 2026c) against its pre-war October 2025 forecasts (IMF, 2025b), converted to a level gap. This is our own method, and it also picks up revisions unrelated to the war. The implied gap is −18.8% for Iraq, Kuwait and Bahrain together, against our −19.3%, and −7.0% for Saudi Arabia, against our −6.7%. For Qatar the implied gap (−20.4%) lies between our central case (−30.2%) and the shock to exports (−12.9%). For the UAE (−8.5%) and Iran (−8.6%) it is larger than ours (−4.8% and −3.8%). Outside the Gulf the IMF raised most of its 2026 forecasts, by up to about 0.8 points, and left the EU unchanged, so the check cannot detect war losses as small as ours.

The UAE gap is consistent with losses outside energy, such as aviation, tourism, finance and confidence, which the model does not shock; the IMF puts the GCC's non-oil economy 0.8% lower in 2026 (IMF, 2026a). Iran's larger gap is consistent with war damage inside Iran and tighter sanctions, which the model also leaves out. Against model-based peers, our 2026 crude price rise for buyers (8.7%) is below the Kiel and WIFO estimate of 12.1% (Hinz et al., 2026; Pokhrel, 2026). Our 2026 world GDP gap of 0.32% is a level gap rather than a growth rate, so it compares only roughly with the Dallas Fed's estimate that world growth would be 0.2 to 0.3 points lower after a disruption of one or two quarters (Kilian, Plante and Richter, 2026).

7. Discussion

7.1 Limitations

- **Annual model.** Price spikes within the year are averaged out, so peak prices were far higher than the yearly changes reported here. The CGE model's energy price changes are too small for this reason, and prices are taken from the short-run price model (Section 3.6).
- **Price model.** The 2027 oil price if fighting continues assumes that oil stocks (commercial and government) can be drawn as in 2026. The no-war gas baseline is the pre-war winter level rather than futures prices, which probably understates the gas gaps, and the historical consumer price pass-through is extrapolated far beyond the oil price rises in its sample for 2027 if fighting continues.
- **Shock to production versus shock to exports.** The central case treats lost oil and refining output as lost capacity. Applying the same data as a shock to exports gives much smaller Gulf losses (Section 6.2), so the split between the two is the largest modelling uncertainty for the Gulf in this paper. Its larger importer losses mostly come from the value the export-cut method treats as lost in transit, about $225bn in 2026.
- **Idle plant.** In the central case, crude oil and refining output in the Gulf is set to the measured or assumed cut, and the model meets that target through a fall in the sector's productivity. The sector therefore keeps most of its workers and capital while producing less, much as damaged or shut-in plant does in the short run, when its capital cannot move to other uses. This is how the model applies an output cut, and it makes Gulf GDP losses, Qatar's in particular, larger than they would be if those workers and that capital were released to other sectors. The shock-to-exports sensitivity (Section 6.2) shows the other end of the range.
- **Basic model assumptions.** The basic model keeps employment at its baseline level and lets capital move between sectors within the year. Both likely understate short-run losses; Section 6.1 relaxes the first.
- **Qatar may be overstated.** Its 2026 gap from the no-war path (−30.2%) is larger than the IMF-implied −20.4% (Appendix A.5), and much of its 2030 gap follows from the assumed LNG repair path.
- **Iran's own war damage is not shocked**, only its exports, so its loss is likely understated.
- **Some industry changes are likely overstated, mostly in the war years.** Oil and gas output outside the Gulf rises because the model replaces lost Gulf supply within the year (US, EU and China crude output is 18% to 20% higher in 2027 if fighting continues), while in 2026 most of the gap was met by stocks and lower demand. Other Gulf industries gain because workers and capital freed from idle LNG plant move straight into them, and because Qatar's wages and other costs fall by 52% against world prices, which acts like a large currency fall; neither fits pegged currencies and slow-moving wages, and sticky wages damp it only a little. These effects are concentrated in 2026 and 2027, and in 2028 in the longer war.
- **Strait cost is an upper bound.** It is based on the top of the reported insurance range for March to May 2026, and peak rates are held all year in the longer war.
- **No spare-capacity limit.** Producers outside the Gulf raise output at the model's supply elasticity, and the model cannot say whether that much capacity exists within a year. If it does not, importer losses are understated.
- **Not modelled:** strategic stock releases, demand restraint, fiscal support to households, naval escorts, financial channels, and losses outside energy such as aviation and tourism. The Red Sea route (Bab el-Mandeb) is not shocked.
- **Low gas substitution.** Gas trade elasticities are a fifth of the standard GTAP values, a departure from GTAP chosen because most gas moves on fixed routes; with standard values, Qatar's LNG price collapses under a 70% export cut. A systematic sensitivity analysis of the elasticities is left for further work.

- **Data.** The database is a beta release with a 2022 base year, when energy prices were high, which may raise oil's share of Gulf GDP. Many 2026 figures come from secondary reports of IEA, Kpler and IMF data, and some recovery-year values are assumptions or proxies (Table 5).

7.2 Policy implications

- **An early peace avoids a second year of deep losses.** Ending the war in 2026 rather than mid-2027 spares the Gulf Arab exporters an extra 2027 loss of 9 to 20 points of GDP and leaves every Gulf economy closer to its no-war path in 2030. In 2030 the longer war still costs Qatar 4.9 points of GDP and Iraq, Kuwait and Bahrain 1.2 points.
- **Bypass routes help.** Saudi Arabia and the UAE, which can send part of their crude by pipeline, are 6.7% and 4.8% below their no-war GDP in 2026, against 19.3% for Iraq, Kuwait and Bahrain, which have only a small pipeline route. The cuts also differ, so this is consistent with a bypass effect rather than proof of one.
- **Importers feel it through prices.** In 2026 the GDP of India and of Japan and Korea is less than 0.3% below its no-war path, but welfare per person is 0.8% to 1.1% below, as they pay more for imported energy. On the full first-round effect of the short-run price model, their consumer prices are up to 4.8% above the no-war level in 2026 (Section 5.4). Their exposure runs through import prices, which the model does not offset with stock releases. Europe loses less, and the United States gains slightly.

8. Conclusion

The 2026 Gulf conflict reaches the world economy through lost Gulf production, lost exports and the cost of shipping through the Strait of Hormuz. In the war year, 2026, Gulf GDP is between 3.8% (Iran) and 30% (Qatar) lower than it would have been without the war. The economies with little or no route around the strait are furthest below their no-war path. Outside the Gulf, importers' GDP is less than 0.3% below its no-war path, though their welfare loss is larger, through higher energy prices, and world GDP is 0.32% lower. Six more months of war in 2027 would keep most Gulf economies as far below their no-war path in 2027 as in 2026, or further. It would still leave Qatar's GDP 4.9 points lower in 2030, and that of Iraq, Kuwait and Bahrain (modelled as one group) 1.2 points lower, than if the war ends in 2026. Qatar's figure holds, at 4.7 to 4.9 points, under every model extension.

Two lessons go beyond this war. First, how a supply disruption enters a CGE model matters a great deal: applying the same data as a shock to exports rather than a shock to production gives the producers much smaller losses, and the standard way of cutting exports adds a loss in transit that falls on importers, so studies should test both and report the size of that loss. Second, much of the lasting cost follows from how deeply plant is damaged and how fast it is repaired (Section 5.3), so better evidence on repair times matters for any estimate of the long-run cost. Further work will add the Red Sea route, a war with no end date, the quarterly inflation and interest-rate effects, and a systematic sensitivity analysis of the elasticities.

References

20Cube (2026) *Qatar LNG exports collapsed to 0.23 million tonnes in April*, citing AXSMarine data.

AGBI (2026) Reports on GCC sovereign CDS spreads, March–October.

Aguiar, A., Baldos, U., Chepeliev, M., Corong, E. and Simonato, F. (2025) 'The Global Trade Analysis Project (GTAP) Data Base: Version 12', *Journal of Global Economic Analysis*, 10(2), pp. 1–45. doi:10.21642/JGEA.100201AF.

Aguiar, A., Corong, E. and van der Mensbrugghe, D. (2019) *The GTAP Recursive Dynamic (GTAP-RD) Model: Version 1.0*. West Lafayette, IN: Center for Global Trade Analysis, Purdue University, February. Available at: https://ageconsearch.umn.edu/record/333133.

Al Jazeera (2026) *Which oil and gas facilities in the Gulf have been attacked?*, by A. Chughtai, 4 March (updated 12 March).

Alhajji, A. F. (2003) *Oil production capacity rebuilding experience has implications for Iraq*. *Oil & Gas Journal, 3 November*.

Allianz Research (2026) *Not all emerging markets are equal: Hormuz, triple deficits, and the new energy risk premium*, 17 March. Munich: Allianz.

Amestoy, P. R., Duff, I. S., L'Excellent, J.-Y. and Koster, J. (2001) 'A fully asynchronous multifrontal solver using distributed dynamic scheduling', *SIAM Journal on Matrix Analysis and Applications*, 23(1), pp. 15–41.

Armington, P. S. (1969) 'A theory of demand for products distinguished by place of production', *IMF Staff Papers*, 16(1), pp. 159–178.

Barnichon, R. and Brownlees, C. (2019) 'Impulse response estimation by smooth local projections', *Review of Economics and Statistics*, 101(3), pp. 522–530.

Baumeister, C. and Hamilton, J. D. (2019) 'Structural interpretation of vector autoregressions with incomplete identification: revisiting the role of oil supply and demand shocks', *American Economic Review*, 109(5), pp. 1873–1910.

Beckman, J., Hertel, T. and Tyner, W. (2011) 'Validating energy-oriented CGE models', *Energy Economics*, 33(5), pp. 799–806. doi:10.1016/j.eneco.2011.01.005.

Burniaux, J.-M. and Truong, T. (2002) *GTAP-E: An Energy-Environmental Version of the GTAP Model*. GTAP Technical Paper 16. West Lafayette, IN: Purdue University.

Caldara, D., Cavallo, M. and Iacoviello, M. (2019) 'Oil price elasticities and oil price fluctuations', *Journal of Monetary Economics*, 103, pp. 1–20.

CBS News (2026) *Live updates: Iran war, Trump, oil and gas prices, Strait of Hormuz and the midterms*, by F. Andrews and K. Wassef, 23 October (updated 26 October).

Corong, E., Hertel, T., McDougall, R., Tsigas, M. and van der Mensbrugghe, D. (2017) 'The Standard GTAP Model, Version 7', *Journal of Global Economic Analysis*, 2(1), pp. 1–119.

Cyprus Mail (2026) *Qatar LNG exports remain severely disrupted despite recovery in Gulf oil shipments*, citing Kpler, 12 October.

Damodaran, A. (2026) *Country default spreads and risk premiums*, January 2026 update. New York: NYU Stern School of Business.

Dixon, P. B. and Rimmer, M. T. (2002) *Dynamic General Equilibrium Modelling for Forecasting and Policy: A Practical Guide and Documentation of MONASH*. Contributions to Economic Analysis 256. Amsterdam: North-Holland.

EGA (2026) *EGA reaches 50% completion of Al Taweelah smelter restart*, 21 October; with Alba H1 2026 results via alcircle and Hydro on Qatalum.

European Central Bank (ECB) (2026) 'Beyond energy prices: the ripple effects of Gulf supply disruptions', *The ECB Blog*, 2 July. Frankfurt am Main: ECB.

Eurostat (2026) *Harmonised Index of Consumer Prices: all items, euro area (19 countries)*, monthly, via FRED, Federal Reserve Bank of St. Louis (series CP0000EZ19M086NEST).

Goldman Sachs Research (2026) *Iran conflict: how long, and how bad?* Top of Mind, Issue 147, 20 March. New York: Goldman Sachs.

Hamilton, J. D. (2009) 'Causes and consequences of the oil shock of 2007–08', *Brookings Papers on Economic Activity*, Spring, pp. 215–261.

Hertel, T. W. (ed.) (1997) *Global Trade Analysis: Modeling and Applications*. Cambridge: Cambridge University Press.

Hinz, J., Mahlkow, H. and Wanner, J. (2025) *The KITE Model Suite: a quantitative framework for international trade analysis*. White paper. Kiel: Kiel Institute for the World Economy.

Hinz, J., Mahlkow, H., Sogalla, R. and Willmann, G. (2026) *The Cost of Closing the Strait of Hormuz: Energy Bottlenecks and Global Food Security*. Kiel Policy Brief 206, March. Kiel: Kiel Institute for the World Economy.

IIASA (2024) *SSP Scenario Database*, version 3.0, SSP2. Laxenburg: International Institute for Applied Systems Analysis.

International Energy Agency (IEA) (2026a) *Oil Market Report*, March–October issues; with Kpler refinery and export data and the JODI Oil World Database (Saudi Arabia).

International Energy Agency (IEA) (2026b) *Strait of Hormuz factsheet*. Paris: IEA, February.

International Monetary Fund (IMF) (2025a) *Global Financial Stability Report*, April 2025, chapter 2. Washington, DC: IMF.

International Monetary Fund (IMF) (2025b) *World Economic Outlook, October 2025: Global Economy in Flux, Prospects Remain Dim*; and World Economic Outlook database, October 2025 vintage (IMF Data Portal, dataset WEO_2025_OCT_VINTAGE: real GDP growth NGDP_RPCH, GDP in US dollars NGDPD). Washington, DC: IMF.

International Monetary Fund (IMF) (2026a) *Regional Economic Outlook: Middle East and Central Asia*, October 2026, as reported by The National (22 October) and EnterpriseAM (25 October).

International Monetary Fund (IMF) (2026b) *World Economic Outlook*, April 2026, chapter 3. Washington, DC: IMF.

International Monetary Fund (IMF) (2026c) *World Economic Outlook, October 2026: Resilience Under Strain, Urgent Choices*; and World Economic Outlook database, October 2026 (IMF Data Portal, dataset WEO, published 13 October). Washington, DC: IMF. Gulf figures also as reported by The National, 13 October 2026.

International Monetary Fund (IMF) (2026d) *Primary Commodity Prices*: Japan LNG import price, European natural gas price and aluminium price, monthly, via FRED, Federal Reserve Bank of St. Louis (series PNGASJPUSDM, PNGASEUUSDM, PALUMUSDM).

Ivanič, M. (2025) *GlobalTradeAnalysisProjectModelV7.jl: the standard GTAP model, version 7, in Julia*. Julia package, version 0.1.11. GitHub repository.

Jordà, Ò. (2005) 'Estimation and inference of impulse responses by local projections', *American Economic Review*, 95(1), pp. 161–182.

Känzig, D. R. (2021) 'The macroeconomic effects of oil supply news: evidence from OPEC announcements', *American Economic Review*, 111(4), pp. 1092–1125; oil supply news shock series, vintage 2025M12.

Kilian, L. (2009) 'Not all oil price shocks are alike: disentangling demand and supply shocks in the crude oil market', *American Economic Review*, 99(3), pp. 1053–1069.

Kilian, L. and Murphy, D. P. (2014) 'The role of inventories and speculative trading in the global market for crude oil', *Journal of Applied Econometrics*, 29(3), pp. 454–478.

Kilian, L., Plante, M. and Richter, A. W. (2026) 'What the closure of the Strait of Hormuz means for the global economy', *Dallas Fed Economics*. Dallas: Federal Reserve Bank of Dallas, 20 March.

Klimek, P., Baum, S., Devetak, M., Heß, M., Thurner, S. and Verschuur, J. (2026) *When the Strait Closes: Trade Dependencies and Shipping Disruption Scenarios for the Strait of Hormuz*. Research Brief, 19 March. Vienna: Complexity Science Hub.

Komiss, W. and Huntzinger, L. (2011) *The Economic Implications of Disruptions to Maritime Oil Chokepoints*. CNA report D0024669.A1, March. Arlington, VA: CNA.

Krane, J. and Alexander, J. (2026) *Losing Hormuz: the costs of war for Gulf oil exporters*. Working paper. Houston, TX: Rice University's Baker Institute for Public Policy, April. doi:10.25613/TKP5-JF69.

Matra (2026) *Open CGE Database, v0.5.5-beta*.

McDougall, R. and Golub, A. (2007) *GTAP-E: A Revised Energy-Environmental Version of the GTAP Model*. GTAP Research Memorandum 15. West Lafayette, IN: Purdue University.

Miller, R. E. and Blair, P. D. (2009) *Input-Output Analysis: Foundations and Extensions*. 2nd edn. Cambridge: Cambridge University Press.

MS NOW (2026) *Trump plans to resume strikes on Iran day after midterm elections*, by F. Schwartz and I. Rashid, 30 October.

NPR (2026) *Gulf countries that host U.S. military bases say Iran has retaliated to U.S. strikes*, by A. Batrawy and S. Simon, 28 February.

OECD (2025) *Inter-Country Input-Output (ICIO) Tables*, 2025 edition, 1995–2022. Paris: OECD.

OECD (2026) *Consumer price indices*, monthly, 1990–2026, OECD Data Explorer; with the IMF consumer price index for Japan. Paris: OECD.

Oxford Economics (2026) *Impact of the Iran war on GCC economies*. Research briefing, 11 March. Oxford: Oxford Economics.

Pokhrel, S. (2026) *How a Strait of Hormuz Closure Would Affect Austria: Evidence from the KITE Model*. WIFO Research Briefs 3/2026, 8 May. Vienna: Austrian Institute of Economic Research (WIFO).

QCintel (2026) *Qatar says 17% of its LNG capacity damaged, 3–5 years to repair*.

Ramey, V. A. and Zubairy, S. (2018) 'Government spending multipliers in good times and in bad: evidence from US historical data', *Journal of Political Economy*, 126(2), pp. 850–901.

Reuters (2026a) *US naval blockade squeezes Iran's oil exports, forces crude onto floating storage*, by N. Adomaitis and A. Ghaddar, 30 April.

Reuters (2026b) *Iranian oil exports fall to lowest level in six years, data shows*, by A. Ghaddar, 5 June (via Zawya).

Reuters (2026c) *Blockade succeeds where sanctions failed as Iran oil exports stall*, by A. Ghaddar, E. Tunagur and R. Harvey, 1 September.

Reuters (2026d) *US blockade keeps Iranian crude exports at zero in October, report says*, 13 October (via Al Arabiya).

S&P Global (2026) *Middle East shipping insurance costs rise on Hormuz risks*, citing Marsh; and The National (2026) *War-risk shipping premium surges again*, 17 July.

S&P Global Commodity Insights (2026) *Iraq eyes new crude export routes after Iran war*, 13 July; with The New Arab (2026) *Bypassing Hormuz, Iraq resumes Kirkuk oil exports to Turkey*, and Associated Press (2026) *Iraq and Turkey strike a 1-year oil pipeline deal*, August.

UN Comtrade (2026) HS 310210 (urea), importers' data, March–August 2026 against 2025; with SABIC Agri-Nutrients Q3 2026 earnings release.

US Bureau of Labor Statistics (2026) *Consumer Price Index for All Urban Consumers: all items*, monthly, via FRED, Federal Reserve Bank of St. Louis (series CPIAUCSL).

US Congress Joint Economic Committee (2007) *The Strait of Hormuz and the threat of an oil shock*. Washington, DC, August.

US Energy Information Administration (EIA) (2026) *Short-Term Energy Outlook*, February and October issues; tables 3b–3d (October). Washington, DC: EIA.

Veetil, V. P. and Vemmarath, F. S. (2026) *Macroeconomic risks from maritime trade disruptions*. arXiv preprint arXiv:2607.09951, July.

Vortexa (2026) *High-risk flows report: Iran goes to zero*. October.

Wächter, A. and Biegler, L. T. (2006) 'On the implementation of an interior-point filter line-search algorithm for large-scale non-linear programming', *Mathematical Programming*, 106(1), pp. 25–57. doi:10.1007/s10107-004-0559-y.

Wall Street Journal (2026a) *The Trump-Iran deal allows Tehran to immediately sell oil*, by D. Lieber, 16 June.

Wall Street Journal (2026b) *U.S. warns Gulf of possible short, intense renewal of Iran war after midterms*, by S. Said, S. Holliday, B. Faucon and A. Peled, 28 October.

Wittgenstein Centre for Demography and Global Human Capital (Wittgenstein Centre) (2023) *Wittgenstein Centre Human Capital Data Explorer: population projections (WIC2023)*, SSP2. Vienna: Wittgenstein Centre.

Wood Mackenzie (2026) *Strait of Hormuz closure risks greatest global energy supply shock in decades*. Press release, 20 May. Edinburgh: Wood Mackenzie.

Declaration of AI use

The author designed and directed this research, including the questions, methods, data sources and scenario assumptions. AI agents (Claude, made by Anthropic) assisted under the author's direction. They wrote and ran the model and data-processing code, and they produced the charts and presentation materials to the author's specifications. The AI drafted the initial text, and the author then edited, proofread, checked and finalised it. Every code change and set of results was checked independently by the author and by AI models that had not produced it, including Grok (made by xAI). AI tools are not authors of this paper. The author approved every result and takes full responsibility for the paper's content, including any errors.

Appendix

A.1 Region and sector mapping

The aggregation follows the code used for the final runs. Each of the 167 regions and 51 sectors of the Matra database (Matra, 2026) is assigned to one model region and one model sector.

Table A.1a. Regions: model region and the database regions it contains

Model region	Database regions
Qatar	Qatar
Saudi Arabia	Saudi Arabia
United Arab Emirates	United Arab Emirates
Iraq, Kuwait and Bahrain	Bahrain, Iraq, Kuwait
Iran	Iran
Egypt	Egypt
China (incl. Hong Kong)	China, Hong Kong
India	India
Japan and Korea	Japan, South Korea
European Union (27)	Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden
United States	United States
Rest of world (126)	Afghanistan, Albania, Algeria, Angola, Argentina, Armenia, Australia, Azerbaijan, Bangladesh, Belarus, Benin, Bhutan, Bosnia and Herzegovina, Botswana, Brazil, Brunei Darussalam, Burkina Faso, Cabo Verde, Cambodia, Cameroon, Canada, Central African Republic, Chad, Chile, Colombia, Congo Republic, Costa Rica, Cote d'Ivoire, DR Congo, Dominican Republic, El Salvador, Equatorial Guinea, Ethiopia, Fiji, Gabon, Gambia, Georgia, Ghana, Guatemala, Guinea, Guinea-Bissau, Guyana, Honduras, Indonesia, Israel, Jordan, Kazakhstan, Kenya, Kyrgyz Republic, Laos, Lebanon, Lesotho, Liberia, Libya, Macao, Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Morocco, Mozambique, Myanmar, Namibia, Nepal, New Zealand, Nicaragua, Niger, Nigeria, North Korea, Norway, Oman, Pakistan, Palestine, Panama, Papua New Guinea, Peru, Philippines, Rest of Caribbean, Rest of EFTA (Iceland, Liechtenstein), Rest of North Africa, Rest of North America, Rest of Oceania, Rest of South America, Rest of Western Balkans (Montenegro, Kosovo), Rest of Western Europe (Andorra, Monaco, San Marino), Russia, Sao Tome and Principe, Senegal, Serbia, Sierra Leone, Singapore, Solomon Islands, South Africa, Sri Lanka, Suriname, Swaziland, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Thailand, Timor-Leste, Togo, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Uganda, Ukraine, United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zambia, Zimbabwe

Table A.1b. Sectors: model sector and the database sectors it contains

Model sector	Database sectors
Crude oil	Crude oil
Natural gas	Natural gas
Refined products	Petroleum products
Coal	Coal
Electricity	Electricity
Aluminium and other non-ferrous metals	Non-ferrous metals
Chemicals and fertilisers	Chemicals
Water transport	Sea transport
Other transport	Land transport, Air transport, Warehousing
Agriculture and food	Crops and livestock, Forestry, Fishing, Food beverages and tobacco
Other manufacturing	Metal ores, Other mining, Mining support, Textiles apparel and leather, Wood products, Paper and printing, Pharmaceuticals, Rubber and plastics, Non-metallic minerals, Iron and steel, Fabricated metal products, Electronics, Electrical equipment, Machinery, Motor vehicles, Ships, Other transport equipment, Other manufacturing
Other services	Water and waste, Construction, Wholesale and retail trade, Postal services, Hotels and restaurants, Publishing and broadcasting, Telecommunications, Information technology, Finance and insurance, Real estate, Professional services, Administrative services, Public administration, Education, Health, Arts and recreation, Other services, Household employers

A.2 Full results

Full year-by-year results for 2026 to 2030, all regions, both scenarios and both versions (real GDP, welfare, investment, employment, terms of trade, and trade, output and prices by sector) are available as a downloadable data file accompanying the paper. Gulf aluminium output is not reported for the years after its shock ends (Section 6.1).

A.3 Risk premium paths

Region	Central peak, percentage points	High peak	Low peak	Fade after the war
Saudi Arabia	0.15	0.85	0	Halves in the first year, then zero (central)
UAE, Qatar	0.25	0.85	0	As above
Iraq, Kuwait, Bahrain	0.9	2.7, fading over 8 years	0.25	As above (central)
Iran	2.7	2.7, held	0.6	Straight line to zero over 8 years (central)

Sizes from IMF (2025a, 2026b), Damodaran (2026) and AGBI (2026); fade paths assumed.

A.4 Shock to exports

Full results for the shock to exports of Section 6.2, GTAP-RD with the central risk premium (Section 6.1), which is the central result for this version; the final runs cover every model specification. All values are % differences from the no-war baseline in the same year; A = war ends in 2026, B = war continues into 2027. The basic run of the longer war did not solve in 2029 (Section 6.2); an earlier basic run is shown in Appendix A.9.

Table A1. Real GDP, shock to exports

Region	2026	2027 A	2027 B	2028 A	2028 B	2029 A	2029 B	2030 A	2030 B
Qatar	−12.9	−4.8	−13.9	−3.6	−6.6	−2.2	−5.7	−2.1	−4.7
Iraq, Kuwait, Bahrain	−6.5	−2.4	−9.7	−2.0	−4.4	−1.9	−3.8	−1.8	−3.6
Saudi Arabia	−2.4	−0.79	−4.0	−0.45	−1.6	−0.43	−1.2	−0.41	−0.94
UAE	−2.8	−0.18	−5.1	−0.27	−1.3	−0.20	−1.1	−0.19	−0.84
Iran	−4.6	−0.08	−6.0	−0.46	−0.25	−0.58	−0.60	−0.66	−0.86
Egypt	−0.70	−0.13	−0.83	0.03	−0.18	0.02	−0.03	0.02	0.05
India	−1.5	−0.54	−1.7	−0.15	−0.81	−0.08	−0.46	−0.08	−0.23
Japan and Korea	−1.3	−0.42	−1.5	−0.12	−0.76	−0.07	−0.46	−0.07	−0.19
China	−0.42	−0.13	−0.47	−0.05	−0.21	−0.04	−0.14	−0.04	−0.09
European Union	−0.27	−0.11	−0.33	−0.05	−0.16	−0.03	−0.11	−0.03	−0.08
United States	0.02	0.01	0.03	0.01	0.02	0.00	0.01	0.00	0.01
Rest of world	−0.08	−0.01	−0.08	0.01	0.00	0.01	0.01	0.01	0.02
World	−0.40	−0.12	−0.49	−0.05	−0.20	−0.04	−0.14	−0.04	−0.09

Table A2. Welfare (utility per person), shock to exports

Region	2026	2027 A	2027 B	2028 A	2028 B	2029 A	2029 B	2030 A	2030 B
Qatar	−30.7	−14.2	−31.8	−9.0	−16.6	−2.1	−13.2	−1.8	−8.9
Iraq, Kuwait, Bahrain	−24.7	−7.2	−28.7	−1.7	−9.8	−1.6	−4.8	−1.5	−3.1
Saudi Arabia	−8.3	−1.9	−11.6	−0.33	−3.2	−0.34	−1.8	−0.31	−0.72
UAE	−4.6	1.4	−10.5	−0.03	−2.3	−0.14	−1.2	−0.12	−0.46
Iran	−8.1	0.29	−9.6	−0.46	0.56	−0.55	−0.22	−0.59	−0.74
Egypt	−0.07	0.01	−0.06	0.05	0.00	0.01	0.03	0.01	0.05
India	−1.8	−0.46	−2.2	−0.12	−0.75	−0.07	−0.44	−0.07	−0.20
Japan and Korea	−1.4	−0.38	−1.8	−0.11	−0.70	−0.06	−0.42	−0.05	−0.16
China	−0.71	−0.13	−0.80	−0.04	−0.22	−0.03	−0.14	−0.03	−0.07
European Union	−0.61	−0.17	−0.73	−0.07	−0.26	−0.03	−0.16	−0.03	−0.09
United States	0.20	0.05	0.31	0.01	0.09	0.00	0.04	0.00	0.01
Rest of world	0.63	0.16	0.91	0.05	0.26	0.01	0.13	0.01	0.05

A.5 Rough validation against IMF forecast revisions

This annex compares the model's GDP results with the change in the IMF's forecasts between its last outlook before the war and its latest one. It is a rough check, not a test: forecast revisions also reflect news unrelated to the war, and the IMF's war assumptions differ from ours.

Method. We take each country's real GDP growth forecasts from the IMF's October 2025 World Economic Outlook database, published before the war (IMF, 2025b), and from its October 2026 database (IMF, 2026c). Chaining each vintage's growth forecasts from 2026 onward gives a forecast GDP level for each year, and the implied gap from the no-war path in year t is the post-war level over the pre-war level, minus one: gap(t) = [(1 + g_post,2026) × … × (1 + g_post,t)] / [(1 + g_pre,2026) × … × (1 + g_pre,t)] − 1. For 2026 this is simply (1 + g_post) / (1 + g_pre) − 1; for Qatar, (1 − 0.1558) / (1 + 0.0609) − 1 = −20.4%. This is the IMF-side equivalent of our results, which are also each year's level gap from a no-war path; it is not a sum of yearly results. Groups of countries are weighted by their 2025 GDP in US dollars from the pre-war database, using the 187 countries with complete data. The method and weights are our own (assumed, no source). India's, Egypt's and Iran's forecasts

are for fiscal years. With these weights, world growth for 2026 is 2.6% before the war and 2.5% after, the same as the IMF's own market-rate figures (IMF, 2025b, 2026c).

2026 (Table A3). For Saudi Arabia and for Iraq, Kuwait and Bahrain the central case lands within 0.6 point of the IMF-implied gap (−6.7% against −7.0%, and −19.3% against −18.8%). For Qatar the IMF-implied gap of −20.4% lies between our central case (−30.2%) and the shock to exports (−12.9%). For the UAE and Iran the IMF-implied gaps (−8.5% and −8.6%) are larger than ours (−4.8% and −3.8%), which is consistent with losses the model does not shock: aviation, tourism and finance in the UAE, and war damage and tighter sanctions inside Iran (Section 7.1). Outside the Gulf the IMF raised most 2026 forecasts, by up to about 0.8 points (India); it left the EU unchanged, and its world forecast is slightly lower (−0.04%, against our −0.32%). Other news therefore outweighs importer war losses as small as ours (0.3% or less), and the check can neither confirm nor reject them.

2027 and 2030 (Table A4). The IMF assumes the strait reopens gradually from March 2027 and is back to pre-war conditions broadly by October 2027 (IMF, 2026c), a path between our two scenarios. Its implied 2027 gaps for the Gulf Arab exporters also lie between our two scenarios: closer to the war ending in 2026 for Qatar, Iraq, Kuwait and Bahrain and Saudi Arabia (for Qatar, −12.3% against −10.7% and −28.6%), and closer to the war continuing for the UAE (−5.9% against −0.38% and −9.9%). By 2030 the IMF-implied gaps for Iraq, Kuwait and Bahrain, Saudi Arabia, the UAE and Iran are larger than in either of our scenarios, while Qatar's is smaller (−0.52%). We have not traced these differences; the IMF's later-year forecasts also carry revisions unrelated to the war.

Table A3. Real GDP in 2026: IMF forecast revisions against the model. IMF forecasts are growth rates, %; the implied gap and model columns are % differences from the no-war path in 2026.

Region	IMF growth forecast for 2026, before the war (Oct 2025)	IMF growth forecast for 2026, after (Oct 2026)	IMF-implied gap from the no-war path, 2026	Model, central case	Model, shock to exports
Qatar	6.1	−15.6	−20.4	−30.2	−12.9
Iraq, Kuwait, Bahrain	3.7	−15.8	−18.8	−19.3	−6.5
Saudi Arabia	4.0	−3.3	−7.0	−6.7	−2.4
UAE	5.0	−3.9	−8.5	−4.8	−2.8
Iran	1.1	−7.6	−8.6	−3.8	−4.6
Egypt	4.5	5.1	0.62	0.02	−0.70
India	6.2	7.0	0.80	−0.29	−1.5
Japan and Korea	1.0	1.5	0.53	−0.17	−1.3
China	4.1	4.5	0.32	−0.10	−0.42
European Union	1.3	1.3	0.00	−0.10	−0.27
United States	2.1	2.3	0.22	0.04	0.02
Rest of world	2.6	2.8	0.19	0.06	−0.08
World	2.6	2.5	−0.04	−0.32	−0.40

Sources: IMF (2025b, 2026c); our calculation. Model: basic GTAP-RD; shock to exports with the central risk premium (Section 6.2).

Table A4. Real GDP in 2027 and 2030: IMF-implied gap against the two war paths, % difference from the no-war path in that year (central case)

Region	2027: IMF-implied	2027: war ends in 2026	2027: war continues	2030: IMF-implied	2030: war ends in 2026	2030: war continues
Qatar	−12.3	−10.7	−28.6	−0.52	−3.3	−8.2
Iraq, Kuwait, Bahrain	−7.2	−4.5	−24.3	−3.7	−0.95	−2.1
Saudi Arabia	−2.8	−1.7	−10.3	−1.1	−0.24	−0.62
UAE	−5.9	−0.38	−9.9	−2.3	−0.10	−0.55
Iran	−6.8	−0.02	−4.8	−7.4	−0.13	−0.26
Egypt	0.67	0.05	0.02	0.69	0.01	0.03
India	1.4	−0.15	−0.42	2.5	−0.05	−0.17
Japan and Korea	0.77	−0.11	−0.23	0.99	−0.04	−0.12
China	0.17	−0.04	−0.14	0.14	−0.03	−0.07
European Union	−0.15	−0.06	−0.14	−0.24	−0.03	−0.07
United States	0.45	0.01	0.05	0.42	0.00	0.00
Rest of world	0.10	0.02	0.10	0.07	0.00	0.01
World	0.10	−0.09	−0.43	0.20	−0.03	−0.08

Each figure is the gap from the no-war baseline in a given year.

A.6 Baseline and simulated growth

Our results are gaps from the no-war baseline. Table A5 turns them back into growth rates so they can be read beside forecasts. The baseline row is the growth of real GDP on the SSP2 path that the baseline is set to follow (Section 3.4; IIASA, 2024; Wittgenstein Centre, 2023), summed from member countries' market-rate GDP. The two war rows are the growth implied by the baseline and the model's gaps: (1 + baseline growth) × (1 + this year's gap) / (1 + last year's gap) − 1. They re-express the results of Section 5; they are not new results.

Growth rebounds after the war because GDP climbs back toward its no-war path. If the war ends in 2026, Qatar's GDP grows 32.6% in 2027 in the model, against the IMF's post-war forecast of 18.8% for that year (IMF, 2026c). The SSP2 baseline is also below the IMF's pre-war 2026 forecasts for Qatar (3.6% against 6.1%), Iraq, Kuwait and Bahrain (2.8% against 3.7%) and the UAE (4.4% against 5.0%), and above them for Saudi Arabia and Iran (IMF, 2025b). Because our results are measured against the SSP2 path, this difference does not enter the gaps directly, but it matters when simulated growth rates are compared with forecasts.

Table A5. Real GDP growth, %: no-war baseline and simulated war paths (central case)

Region	Path	2026	2027	2028	2029	2030
Qatar	No-war baseline (SSP2)	3.6	3.6	3.6	3.6	3.6
	War ends in 2026	−27.7	32.6	7.8	7.6	3.8
	War continues into 2027	−27.7	5.9	25.5	7.2	6.2
Iraq, Kuwait, Bahrain	No-war baseline (SSP2)	2.8	2.8	2.8	2.8	2.8
	War ends in 2026	−17.0	21.7	6.6	2.9	2.9
	War continues into 2027	−17.0	−3.5	26.7	6.1	4.6
Saudi Arabia	No-war baseline (SSP2)	4.4	4.4	4.4	4.4	4.4
	War ends in 2026	−2.7	10.0	5.9	4.4	4.4
	War continues into 2027	−2.7	0.4	12.9	5.9	5.4
UAE	No-war baseline (SSP2)	4.4	4.4	4.4	4.4	4.4

Region	Path	2026	2027	2028	2029	2030
	War ends in 2026	−0.7	9.3	4.7	4.4	4.4
	War continues into 2027	−0.7	−1.1	13.0	5.6	5.2
Iran	No-war baseline (SSP2)	2.1	2.1	2.1	2.1	2.1
	War ends in 2026	−1.7	6.1	2.0	2.1	2.2
	War continues into 2027	−1.7	1.0	7.2	2.0	2.1
Egypt	No-war baseline (SSP2)	5.9	5.9	5.9	5.9	5.9
	War ends in 2026	5.9	5.9	5.8	5.8	5.9
	War continues into 2027	5.9	5.8	5.9	5.8	5.8
India	No-war baseline (SSP2)	5.8	5.8	5.8	5.8	5.8
	War ends in 2026	5.5	5.9	5.8	5.9	5.8
	War continues into 2027	5.5	5.7	6.0	5.8	5.8
Japan and Korea	No-war baseline (SSP2)	1.1	1.1	1.1	1.1	1.1
	War ends in 2026	1.0	1.2	1.1	1.2	1.1
	War continues into 2027	1.0	1.1	1.2	1.1	1.2
China	No-war baseline (SSP2)	3.7	3.7	3.7	3.7	3.7
	War ends in 2026	3.6	3.8	3.7	3.7	3.7
	War continues into 2027	3.6	3.7	3.8	3.7	3.7
European Union	No-war baseline (SSP2)	1.6	1.6	1.6	1.6	1.6
	War ends in 2026	1.5	1.6	1.6	1.6	1.6
	War continues into 2027	1.5	1.6	1.7	1.6	1.6
United States	No-war baseline (SSP2)	1.9	1.9	1.9	1.9	1.9
	War ends in 2026	1.9	1.8	1.9	1.9	1.9
	War continues into 2027	1.9	1.9	1.8	1.9	1.9
Rest of world	No-war baseline (SSP2)	2.9	2.9	3.0	3.0	3.0
	War ends in 2026	3.0	2.9	2.9	3.0	3.0
	War continues into 2027	3.0	3.0	2.9	3.0	3.0
World	No-war baseline (SSP2)	2.6	2.7	2.7	2.7	2.7
	War ends in 2026	2.3	2.9	2.7	2.7	2.7
	War continues into 2027	2.3	2.5	3.0	2.7	2.7

Model: basic GTAP-RD, central case.

A.7 Refinements to the historical pass-through estimate

We tested six refinements of the historical pass-through estimate of Section 3.6 to see whether they change or sharpen the core consumer price results. None changes them (Table A6). Figures are the consumer price level as a % difference from the no-war baseline in that year, shown as 2026 / 2027 if the war ends in 2026 / 2027 if fighting continues (Brent about $140 a barrel if oil stocks (commercial and government) can be drawn as in 2026), with 90% bootstrap ranges in brackets.

Table A6. Refinements to the historical pass-through estimate

Refinement	Result	What it adds
Smoothed responses, in the spirit of Barnichon and Brownlees (2019)	Same central values; the ranges do not narrow, and the US range is slightly wider	Nothing: the uncertainty is not month-to-month noise
Panel of six advanced economies (United States, euro area, United Kingdom, Canada, Japan, Korea) with a common response	1.0 (0.6 to 1.4) / 1.5 (0.6 to 2.4) / 2.6 (1.4 to 4.0)	A tighter figure for a typical advanced economy
Partial pooling of each economy towards the panel	2026: United States 1.3, euro area 1.0, United Kingdom 0.9, Canada 1.0, Japan 0.9, Korea 1.0; in 2027 each economy takes the panel figure	Differences between economies in 2027 are within sampling noise
Core prices (excluding food and energy)	United States 0.1 / 0.0 / 0.1; euro area −0.1 / −0.2 / −0.3; United Kingdom 0.2 / 0.4 / 0.6; Korea 0.1 / 0.7 / 0.9; Canada −0.3 / −0.6 / −0.9	In the United States and the euro area the effect came almost entirely through energy and food prices
Sample without the 2021–23 surge (windows ending by 2020)	United States 2.0 / 2.2 / 4.4; euro area 1.0 / 1.3 / 2.4; United Kingdom 0.8 / 1.4 / 2.3; Canada 1.2 / 1.2 / 2.5	Close to the core results: the high-inflation case comes mainly from 2021–23
Japan with consumption-tax controls (April 1997, April 2014, October 2019)	0.5 / 0.7 / 1.2, against 0.6 / 1.5 / 2.2 without	Japan's 2027 figures are probably too high
Euro area prices at constant tax rates, 2003–2019	1.2 / 1.8 / 3.1, against 1.2 / 1.6 / 3.0 for headline prices	Tax changes do not distort the euro area estimate

Source: our calculation, local projections on Känzig (2021) oil supply shocks. Japan's consumption-tax rises: April 1997, April 2014 and October 2019.

Three points stand out. A typical advanced economy's consumer prices are about 1% above their no-war level in 2026 and about 2.6% (1.4 to 4.0) above it in 2027 if fighting continues, consistent with the country figures in Table 9. The wide 2027 ranges reflect real uncertainty: smoothing does not narrow them, and pooling does so only by treating the economies as alike. And between 1992 and 2019, oil shocks barely spread into core prices in the United States and the euro area; a wider spread, as in 2021–23, is the main upside risk.

A.8 How each shock value is built

This appendix shows how every yearly value in Tables 3 and 4 is built: the measured figure, the arithmetic, the source, and which parts are our assumptions. Values are % changes from the no-war baseline in that year, unless marked $. "Measured" means taken directly from the source; "derived" means calculated from measured figures; "assumed" means our choice where no source gives the figure. 2026 is the same in both scenarios.

Table A7. Shock to production (central), 2026 (both scenarios)

Shock	Economy	Value	How it is built	Type	Source
Crude output	Saudi Arabia	−15	Monthly output against the 2025 average (9.33 million barrels a day): January–September measured (worst month April, −31%), October–December on EIA's forecast path; average −15.3%	Derived	(EIA, 2026)
Crude output	Iraq, Kuwait, Bahrain	−33	Iraq −30.0, Kuwait −36.3, Bahrain −52.9 (−47.7 without a pre-war January drop), weighted by 2025 output: (4.33×30.0 + 2.49×36.3 + 0.18×52.9) ÷ 6.99 = 32.8	Derived	(EIA, 2026)
Crude output	UAE	−5	Total liquids, 2026 average against 2025: −4.8%. Low because exports moved to the pipeline around the strait, although the worst month was −39%	Measured	(EIA, 2026)
Crude output	Qatar	−53	Total liquids, 2026 average against 2025: −53.3%	Measured	(EIA, 2026)
Refinery output	Saudi Arabia	−20	Kpler's August refinery-run loss (23% of 2025 throughput), spread over the year with Kpler's monthly Middle East run profile	Derived	(IEA, 2026a)

Shock	Economy	Value	How it is built	Type	Source
Refinery output	UAE	−21	As Saudi Arabia; August loss 24% of throughput	Derived	(IEA, 2026a)
Refinery output	Qatar	−71	As Saudi Arabia; August loss 91% of throughput, with monthly losses capped at 90%	Derived	(IEA, 2026a)
Refinery output	Iraq, Kuwait, Bahrain	−33	As Saudi Arabia; August loss Kuwait 57%, Bahrain 97% (capped at 90%), Iraq 0, weighted by refinery runs	Derived	(IEA, 2026a)
Crude exports	Iran	−67	Normal in January–February, −80% from March: 0.80 × 10/12 = 66.7. Tracked data (nearly 1.9 million barrels a day in March, US blockade from 13 April, about 0.2 to 0.26 in May, blockade lifted after the June deal and reinstated on 14 July, zero from mid-September) imply roughly −55% to −70%	Assumed rule, checked against data	(Reuters, 2026a, 2026b, 2026c, 2026d; Wall Street Journal, 2026a)
Refined product exports	Iran	−67	Iran's crude export cut applied to its products; no product export source (Kpler shows Iran's refinery runs down only about 12%)	Assumed	(Reuters, 2026c)
LNG exports	Qatar	−70	Monthly cargoes: January–February about 14.2 million tonnes, March 0.47, April 0.23, May and July about 1.3 together, June 0.84, August about 0, September 1.6, October 0.6 (projection), November–December 1.1 a month (assumed). About 21.4 million tonnes against 6.4 a month normally = −72%; −70% kept as the milder end	Derived	(20Cube, 2026; Cyprus Mail, 2026)
Aluminium output	UAE	−32	Al Taweelah (58% of UAE output) hit on 28 March, then restarted at the reported pace (half its cells back by 21 October, extrapolated to 68% by December): it runs 45% of the year, so 0.58 × 54.8 = 31.8	Derived; November–December extrapolated	(EGA, 2026)
Aluminium output	Bahrain	−27	Alba: January–February normal, March −30, April–June −61 (second-quarter output), July–December −19 (lines 1–3 still shut): (30 + 3×61 + 6×19) ÷ 12 = 27.3	Derived	(EGA, 2026)
Aluminium output	Qatar	−33	Qatalum at about 60% of capacity from March: 10/12 × 40 = 33.3	Derived	(EGA, 2026)
Urea exports	Saudi Arabia	−38	Importers' data, March–August −62.9%; September–December −20% (assumed; SABIC's results give no volume figure): (6×62.9 + 4×20) ÷ 12 = 38.1	Derived; September–December assumed	(UN Comtrade, 2026)
Urea exports	Qatar	−35	March–August −42.2%, held for September–December (assumed): 10/12 × 42.2 = 35.2	Derived; September–December assumed	(UN Comtrade, 2026)
Urea exports	UAE	−61	March–August −73.4%, held (assumed): 10/12 × 73.4 = 61.2	Derived; September–December assumed	(UN Comtrade, 2026)
Urea exports	Bahrain	−72	March–August −86.4%, held (assumed): 10/12 × 86.4 = 72.0	Derived; September–December assumed	(UN Comtrade, 2026)
Strait cost, crude and products	Gulf flows	$3.9/bbl	2026 average war-risk premium of 6.56% of hull value per voyage × a $120m tanker ÷ 2 million barrels = $3.94. Based on the top of the reported range for March–May, so an upper bound	Derived; vessel value and cargo size assumed typical	(S&P Global, 2026)
Strait cost, LNG	Gulf flows	$4.7/MMBtu	6.56% × a $250m carrier ÷ 3.5 million MMBtu = $4.69	Derived; as above	(S&P Global, 2026)

Table A8. Shock to production (central), war ends in 2026: 2027 onward

Shock	Economy	Year	Value	How it is built	Type	Source
Crude output	Saudi Arabia	2027	−4	December 2026 gap (−12.7%) closes along EIA's Middle East capacity path (back to normal by May): −3.7%	Derived	(EIA, 2026)
Crude output	Iraq, Kuwait, Bahrain	2027	−7	Same method: Iraq −4.1, Kuwait −11.5, Bahrain −14.5, output-weighted −7.0	Derived	(EIA, 2026)
Crude output	UAE	2027	0	No cut: output already close to normal by late 2026	Assumed	(EIA, 2026)
Crude output	Qatar	2027	−24	EIA forecast for Qatar total liquids, 2027 average −23.6%	Measured (forecast)	(EIA, 2026)
Crude output	Qatar	2028	−17	Follows the LNG damage: 17% of capacity damaged, held all year with no repair progress in 2028	Assumed (liquids follow LNG)	(QCintel , 2026)
Refinery output	Saudi Arabia / UAE / Qatar / Iraq, Kuwait, Bahrain	2027	−4 / −5 / −17 / −7	The December 2026 loss recovers in a straight line to normal by end-June 2027 (4.3 / 4.5 / 16.6 / 7.4)	Derived; recovery timing from Kpler	(IEA, 2026a)
LNG exports	Qatar	2027	−24	EIA's Qatar total-liquids path used as a proxy, since EIA does not forecast LNG; implies the strait is still impaired in early 2027	Proxy (assumed)	(EIA, 2026)
LNG exports	Qatar	2028	−17	17% of capacity damaged (trains 4 and 6), held all year with no repair progress in 2028; zero from 2029	Measured damage; timing assumed	(QCintel , 2026)
Aluminium output	UAE	2027	−2	Al Taweelah at 78% in January, 88% in February, 95% in March, full from April: 0.58 × (0.22 + 0.12 + 0.05) ÷ 12 = 1.9	Derived	(EGA, 2026)
Aluminium output	Bahrain	2027	−10	Lines 1–3 restart during 2027; no restart date reported	Assumed	(EGA, 2026)
Aluminium output	Qatar	2027	−25	Qatalum reported stable at about 60%, with no restart date; −25 assumes a partial restart (−40 if nothing changes)	Assumed	(EGA, 2026)
Iran exports; urea exports	Iran; Gulf urea exporters	2027	0	Cuts lifted when the war ends	Assumed	—
Strait cost	Gulf flows	2027 – 2030	$0.20 / 0.13 / 0.07 / 0 per bbl; $0.25 / 0.17 / 0.08 / 0 per MMBtu	A lasting add-on of 0.35% of hull value: 0.35% × $120m ÷ 2 million barrels = $0.21; 0.35% × $250m ÷ 3.5 million MMBtu = $0.25. 2019 premiums were lower. The add-on then fades in a straight line to zero over three years: two thirds in 2028, one third in 2029, zero in 2030	Assumed; no primary source	—

Table A9. Shock to production (central), war continues into 2027: 2027 onward

The rule for six more months of fighting (assumed): during the fighting each producer falls back to its worst 2026 month; for the rest of the year it sits at its damage level; the pipelines around the strait are shut for three months; after 2027 the damage is repaired in a straight line, over three years for oil and five years for LNG, starting from mid-2027.

Shock	Economy	Year	Value	How it is built	Type	Source
Crude output	Saudi Arabia	2027	−27	Half the year at the worst 2026 month (−30.8%, April) + half at a damage level of 10% + a three-month outage of the East–West pipeline to Yanbu (−7 points): 0.5×30.8 + 0.5×10 + 7 = 27.4	Worst month measured; damage level and outage assumed	(EIA, 2026; IEA, 2026b)
Crude output	Saudi Arabia	2028 / 2029 / 2030	−7 / −3 / 0	Damage of 10% repaired over three years: two thirds left in 2028, one third in 2029	Assumed	(Alhajji, 2003)
Crude output	UAE	2027	−34	Half the year at the worst month (−39.2%, March) + half at a damage level of 10% + a three-month outage of the ADCOP pipeline to Fujairah (−9.5 points): 0.5×39.2 + 0.5×10 + 9.5 = 34.1	Worst month measured; damage level and outage assumed	(EIA, 2026; IEA, 2026b)
Crude output	UAE	2028 / 2029 / 2030	−7 / −3 / 0	As Saudi Arabia	Assumed	(Alhajji, 2003)
Crude output	Iraq, Kuwait, Bahrain	2027	−44	Same rule, no pipeline term (no bypass): Iraq 0.5×70 + 0.5×10 = 40; Kuwait 0.5×77.9 + 0.5×23 = 50.5; Bahrain 0.5×82.9 + 0.5×29 = 56; output-weighted 44.1	Worst months measured; damage levels assumed	(EIA, 2026)
Crude output	Iraq, Kuwait, Bahrain	2028 / 2029 / 2030	−10 / −5 / 0	Weighted damage of 15.1% repaired over three years: 2/3 × 15.1 = 10.1; 1/3 × 15.1 = 5.0	Assumed	(Alhajji, 2003)
Crude output	Qatar	2027	−60	Half the year at the worst month (−85.8%) + half at the LNG damage level, doubled to 34% of capacity (17% measured): 0.5×85.8 + 0.5×34 = 59.9	Worst month and 17% measured; doubling assumed	(EIA, 2026; QCintel, 2026)
Crude output	Qatar	2028 / 2029 / 2030	−27 / −20 / −14	Damage of 34% repaired over five years from mid-2027: 34 × (1 − t/5) = 27.2, 20.4, 13.6	Assumed	(QCintel, 2026)
Refinery output	All Gulf producers	2027 – 2029	2027: UAE −21, Saudi Arabia −20, Iraq, Kuwait, Bahrain −31, Qatar −62; 2028 / 2029 / 2030: UAE and Saudi Arabia −7 / −3 / 0, Iraq, Kuwait, Bahrain −10 / −5 / 0, Qatar −22 / −11 / −3	The crude rule applied to refinery runs: half the year at the April 2026 low (about −30 for Saudi Arabia, −32 for the UAE, −48 for Iraq, Kuwait and Bahrain, −90 for Qatar, capped at 90%) + half at the damage level, twice the first scenario's 2027 shortfall with a 10% floor (10 / 10 / 15 / 33); the damage is then repaired in a straight line over three years from mid-2027 (Qatar's remaining 3% in 2030 assumed)	—	(IEA, 2026a)
LNG exports	Qatar	2027	−65	Half the year at the April 2026 level (0.23 against 6.4 million tonnes = −96.4%) + half at the doubled damage of 34%: 0.5×96 + 0.5×34 = 65	April measured; doubling assumed	(20Cube, 2026; QCintel, 2026)

Shock	Economy	Year	Value	How it is built	Type	Source
LNG exports	Qatar	2028 / 2029 / 2030	−27 / −20 / −14	Damage of 34% repaired over five years from mid-2027	Assumed	(QCintel, 2026)
Crude and product exports	Iran	2027	−80	Tracked loadings near zero since September 2026; −80% allows for untracked flows; held until the war ends	Assumed	(Reuters, 2026d; Vortexa, 2026)
Aluminium output	UAE	2027	−33	Al Taweelah hit again and restarted at the 2026 pace from 1 January: it runs 42.75% of the year, so 0.58 × 57.25 = 33.2	Derived from the 2026 pace; second strike assumed	(EGA, 2026)
Aluminium output	Bahrain	2027 / 2028	−40 / −10	Second-quarter 2026 level (−61%) for six months, then lines 4–6 only (−19%): 0.5×61 + 0.5×19 = 40. Lines 1–3 restart during 2028	2027 derived; 2028 assumed	(EGA, 2026)
Aluminium output	Qatar	2027 / 2028	−40 / −25	The 2026 level (−40%) all year; restart a year later than in the first scenario	Assumed	(EGA, 2026)
Urea exports	Saudi Arabia / Qatar / UAE / Bahrain	2027	−32 / −21 / −37 / −43	The March–August 2026 level for six months: 0.5 × 62.9 / 42.2 / 73.4 / 86.4 = 31.4 / 21.1 / 36.7 / 43.2	Derived; six months assumed	(UN Comtrade, 2026)
Strait cost, crude and products	Gulf flows	2027	$5.9/bbl	Peak war-time premium of 9.8% of hull value held all year: 9.8% × $120m ÷ 2 million barrels = $5.88	Assumed (top of the range)	(S&P Global, 2026)
Strait cost, LNG	Gulf flows	2027	$7.0/MMBtu	9.8% × $250m ÷ 3.5 million MMBtu = $7.0	Assumed (top of the range)	(S&P Global, 2026)
Strait cost	Gulf flows	2028 – 2030	$0.20 / 0.13 / 0.07 per bbl; $0.25 / 0.17 / 0.08 per MMBtu	The lasting add-on of Table A8 from 2028, fading in a straight line to zero over three years	Assumed; no primary source	—

Table A10. Shock to exports (Section 6.2): rows that differ from the central case

In the shock to exports, every shock takes the same value as in the central case, year by year, in both scenarios. The difference is that the oil cuts are applied to exports instead of output. The strait cost uses the same dollar add-on. Refined products are the exception. This version uses Gulf product export losses, while the central case uses refinery-run losses, because the two are measured differently.

Shock	Economy	Year	Value	How it is built	Type	Source
Refined product exports	Saudi Arabia	2026	−28	Monthly exports against February 2026 (1,653 thousand barrels a day): March–August measured, September–December held at August; average 1,189 = −28.0% (−20% against the 2025 average)	Derived; September–December assumed	(IEA, 2026a)
Refined product exports	UAE / Qatar / Iraq, Kuwait, Bahrain	2026	−61	Gulf product exports outside Saudi Arabia and Iran = the all-route total (IEA, Kpler) minus Saudi Arabia (JODI) minus Iran, against a February base of 2.33 million barrels a day: −60.5%, applied to each of the three	Derived; one share for all three assumed	(IEA, 2026a)
Refined product exports	Saudi Arabia	2027, first scenario	−6.5	December 2026 level (69% of base) recovers in a straight line to normal by end-June 2027: 31 × 2.5/12 = 6.5	Derived; recovery timing from Kpler	(IEA, 2026a)
Refined product exports	UAE / Qatar / Iraq, Kuwait, Bahrain	2027, first scenario	−11	December 2026 level (48% of base) recovers in a straight line by end-June 2027: 51.6 × 2.5/12 = 10.7	Derived	(IEA, 2026a)
Refined product exports	All Gulf producers	2027–2029, war continues	2027 / 2028 / 2029: Saudi Arabia −26 / −9 / −4; UAE, Qatar, Iraq, Kuwait, Bahrain −58 / −14 / −7	The crude rule applied to product exports: half the year at the April 2026 low (Saudi Arabia −38.9%, others −95.1%) + half at the damage level, twice the first scenario's 2027 shortfall with a 10% floor (Saudi Arabia 13, others about 21): 0.5×38.9 + 0.5×13 = 26; 0.5×95.1 + 0.5×21.4 = 58. Repaired over three years from mid-2027: two thirds left in 2028, one third in 2029	—	(IEA, 2026a)

A.9 Earlier basic run of the longer war, shock to exports

The basic GTAP-RD run of the longer war under the shock to exports solved for 2026 to 2028 with every target exact, but not in 2029 (Section 6.2). An earlier basic run with the same shocks did solve in every year. It used a shortcut after the fighting (a carry-over rule) that did not hold each export flow exactly at its sourced level, so exports drifted from their targets in the recovery years. We do not use it in the main text, but show it here, next to the run we do use, to show that it was run and how close the two are.

Table A11. Real GDP, shock to exports, longer war: run used in the main text and earlier basic run

Region	Year	With central risk premium, targets held exactly (used in the main text)	Earlier basic run, carry-over rule	Difference (points)
Qatar	2027	−13.9	−13.9	−0.02
Qatar	2028	−6.6	−4.9	−1.7
Qatar	2030	−4.7	−4.1	−0.66
Iraq, Kuwait, Bahrain	2027	−9.7	−9.6	−0.07
Iraq, Kuwait, Bahrain	2028	−4.4	−3.7	−0.61
Iraq, Kuwait, Bahrain	2030	−3.6	−3.3	−0.30
Saudi Arabia	2027	−4.0	−4.0	−0.02
Saudi Arabia	2028	−1.6	−1.5	−0.06

Region	Year	With central risk premium, targets held exactly (used in the main text)	Earlier basic run, carry-over rule	Difference (points)
Saudi Arabia	2030	−0.94	−0.91	−0.03
UAE	2027	−5.1	−5.1	−0.03
UAE	2028	−1.3	−1.1	−0.20
UAE	2030	−0.84	−0.79	−0.05
Iran	2027	−6.0	−5.6	−0.32
Iran	2028	−0.25	0.00	−0.25
Iran	2030	−0.86	−0.28	−0.58
India	2027	−1.7	−1.7	0.00
India	2028	−0.81	−0.63	−0.18
India	2030	−0.23	−0.20	−0.03
Japan and Korea	2027	−1.5	−1.5	0.00
Japan and Korea	2028	−0.76	−0.57	−0.18
Japan and Korea	2030	−0.19	−0.17	−0.02
China	2027	−0.47	−0.47	0.00
China	2028	−0.21	−0.18	−0.04
China	2030	−0.09	−0.08	0.00
European Union	2027	−0.33	−0.33	0.00
European Union	2028	−0.16	−0.13	−0.03
European Union	2030	−0.08	−0.07	−0.01
United States	2027	0.03	0.03	0.00
United States	2028	0.02	0.01	0.01
United States	2030	0.01	0.01	0.00
World	2027	−0.49	−0.49	0.00
World	2028	−0.20	−0.17	−0.04
World	2030	−0.09	−0.08	−0.01

% difference from the no-war baseline in the same year. Difference = run used in the main text minus earlier basic run, in percentage points. Source: our model runs.

The two runs are almost the same in 2027: less than 0.1 points apart for the Gulf Arab exporters and the importers, and 0.32 points for Iran. In the recovery years they are further apart for Qatar (−6.6% against −4.9% in 2028, and −4.7% against −4.1% in 2030) and for Iran (−0.86% against −0.28% in 2030). Part of the gap is the risk premium, which only the run used in the main text includes, and part is the carry-over rule, which let exports drift off target. Elsewhere the runs are at most 0.61 points apart (Iraq, Kuwait and Bahrain in 2028), and at most 0.2 points for importers. For the war ending in 2026, where the basic run and the risk-premium run both solved with exact targets, they differ by at most 0.52 points.