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Austrian Institute of Economic Research

Internal review: Elisabeth Christen, Harald Oberhofer

Research assistance: Irene Fröhlich

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Abstract

The Strait of Hormuz has been closed for more than two months, and with escalating tensions and failed negotiations, a prolonged closure appears likely. The KITE Computable General Equilibrium (CGE) model effectively captures the ongoing trade disruptions by simulating Gulf energy export shocks under both short-run (low substitution) and long-run (greater adjustment) scenarios. In the short run, Austria faces moderate negative effects: welfare declines by 0.15 percent, real wages drop by 0.15 percent, production loss equals 0.14 percent, and consumer prices rise by 0.15 percent, relative to the baseline, showing vulnerability through worldwide price spillovers. Long-run impacts are smaller: welfare loss falls to about 0.05 percent, and production nearly returns to baseline, highlighting the importance of short-term resilience measures like diversification, stockpiling, and targeted support for exposed sectors. Nevertheless, long-run adjustment does not eliminate the losses. The blockade of the Strait of Hormuz has far-reaching economic effects: in the short run, prices for crude oil rise by 12.1 percent, petroleum products by 8.3 percent, and natural gas by 7.9 percent, with spillovers into chemicals, electricity, plastics, and food, demonstrating how geopolitical shocks propagate through the economy.

E-Mail: sujata.pokhrel@wifo.ac.at

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How a Strait of Hormuz Closure Would Affect Austria: Evidence from the KITE Model

Sujata Pokhrel

1. Context

The Strait of Hormuz – a critical supply route for Gulf energy products – has been closed to global access for more than two months. During this period, the situation has evolved through multiple geopolitical decisions, ranging from full closure to Iran's statement about allowing selected favourable partners to use the route, followed by a ceasefire agreement that temporarily reopened it, and ultimately a return to full closure accompanied by severe US military sanctions on Iranian ports. Recent escalations in the conflict and failed negotiations indicate a likely prolonged closure of the strait. This closure is not merely a regional disruption; it generates global effects on prices and trade reallocation. Its impact extends beyond energy products, affecting multiple downstream sectors – from food to chemicals – depending on their reliance on Gulf supplies. Consumers face higher prices, producers encounter shortages of intermediate goods, and these ripple effects spread across various sectors of the global economy.

While Europe is less directly dependent on Middle Eastern crude oil and LNG than some Asian countries due to relatively greater supply diversification, the region is not entirely insulated from Gulf imports[1]. Disruptions in Gulf energy flows can still have significant consequences for Europe through higher global prices, reallocation of shipments, and cost pass-through into energy-intensive sectors. For this reason, the estimated welfare loss from our simulation – measured as a decline in real income – for the EU is about 0.25% in the short run. By contrast, the United States are only minimally affected in aggregate welfare terms in the short run (a decline of 0.004%), reflecting the lower dependency compared to Europe.

Austria is a small, land locked, open economy, closely integrated into the EU production system, so shocks tend to affect it indirectly. Worldwide price increases influence Austria's import and production costs. The macroeconomic impact, as evident from our analysis, is primarily captured by a reduction in real income due to higher prices and weaker wages, while production effects are more moderate. Although, Austria experiences these effects less severely compared to more directly exposed economies.

We estimate both the short-run and long-run effects[2] of a Strait of Hormuz closure using the KITE Computable General Equilibrium (CGE) model. To approximate Hormuz disruption, we represent the conflict as a sharp increase in trade costs; specifically, we impose shocks on iceberg

[1] EU's imports passing the Strait of Hormuz account for about 8.5% of the liquefied natural gas and 7% of crude oil and petroleum products, according to official EU commission statements (https://www.trtworld.com/article/3b6769303362).

[2] Here, short-run means the period immediately after the shock, when adjustment is limited, and long-run means a later phase in which sourcing and production can adapt more fully.

trade costs to simulate blocked trade flows, where only a fraction of shipped goods effectively reaches their destination, reflecting the heightened frictions and barriers to trade[3].

This report evaluates those effects using KITE and compares Austria with Germany and the EU where useful.

2. Scenario design and modelling approach

We use the KITE CGE model (Hinz et al., 2025), a multi-country, multi-sector trade model with input-output linkages (Caliendo & Parro, 2015; Eaton & Kortum, 2002). The Hormuz scenario is represented as an increase in iceberg trade costs on Gulf energy exports, raising the effective cost of delivering oil, gas, coal, and petroleum products to world markets. The disruption is differentiated across exporters. Iran, Iraq, the United Arab Emirates, Kuwait, Qatar, and Oman are modelled as highly exposed (with iceberg cost multiplier 10[4]), while Saudi Arabia and Bahrain are assigned smaller but still substantial shocks to reflect partial mitigation through alternative infrastructure or lower assumed disruption intensity. We choose a multiplier of 10 to represent a severe disruption rather than a fully prohibitive embargo. This calibration allows for highly impaired but not eliminated trade flows, reflecting the possibility that some shipments may still be rerouted, insured at very high costs, or facilitated through residual alternative export capacity. Accordingly, the scenario should be interpreted as a severe trade dislocation in Gulf energy flows rather than as a mechanical assumption of zero trade.

Two time horizons are reported. The long-run effects are generated by using the standard trade elasticities[5], while the short run is modelled by scaling down these elasticities to one quarter of their long-run values, capturing the limited ability of firms and consumers to adjust immediately after a large trade disruption. The distinction between the short and long run reflects differences in trade adjustment capacity rather than macroeconomic demand frictions. In the short run, lower elasticities reflect constraints in reorganising logistics, whereas in the long run, standard elasticities allow for greater substitution and supply chain reorientation.

3. Simulation results

Three findings stand out. First, a Hormuz disruption generates strongly uneven global effects, with losses concentrated among energy-importing economies, while a smaller set of exporters benefits from trade reallocation and higher world prices. Second, Austria experiences clearly negative short-run effects, though less severe than Germany and the EU average in aggregate welfare terms. Third, the dominant transmission channel is an energy-led price cascade: the largest price increases occur in crude oil, petroleum products and natural gas, with smaller but still visible spillovers into chemicals, electricity and food-related sectors. The results show that the severity of the effects depends critically on the assumed degree of trade adjustment:

[3] According to the Kiel Institute Trade Indicator, the daily number of tankers passing through the Strait of Hormuz decreased from an average of around 40 to nearly zero, and other ships from an average of 25 per day to nearly zero during the war period.

[4] An iceberg cost multiplier of 10 therefore represents a very large increase in trade cost (equivalent to a 1,000% ad valorem tariff). It is used here to capture a severe disruption rather than a fully prohibitive shutdown of trade flows. Unlike a tariff shock, an iceberg trade cost shock does not generate government revenue.

[5] The base KITE model uses sector-specific trade elasticities from the literature where main source is Fontagné et al. (2018).

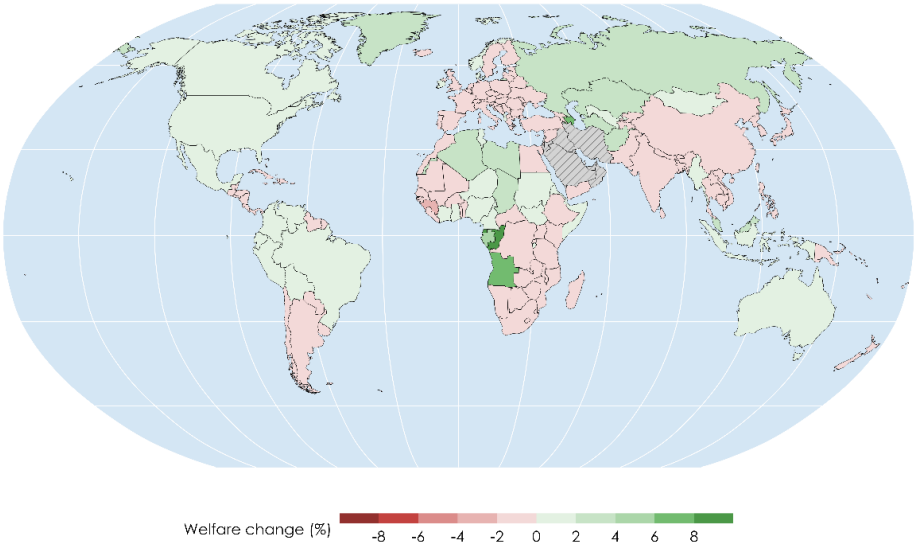
short-run losses are significantly larger than long-run losses because substitution across suppliers is limited immediately after the shock. Long-run reallocation reduces the impact but does not fully eliminate the inflationary and welfare effects.

Note that all results reported here refer to model-based deviations from the baseline under the specified trade-disruption scenario and are not real-time forecasts. They should be interpreted as structural trade-channel effects. Therefore, they capture trade and production-network transmission rather than military destruction or financial-market panic. Moreover, changes in welfare refer to inflation-adjusted changes in real income rather than GDP in the usual sense[6].

Change in global welfare

The short-run welfare map (see Figure 1) highlights strongly uneven global incidence. Losses are concentrated in energy-importing and lower-income economies, while a smaller set of exporters gain from higher world prices. For example, our simulation results show Norway gains in terms of welfare in the short run by 1.82%, despite overall losses across the EU – reflecting the reallocation of energy demand from blocked Gulf producers toward Norwegian alternatives. This distribution underscores that a Hormuz shock is not confined to energy markets; it is also a broader terms-of-trade and purchasing-power shock with heterogeneous effects across countries[7].

Figure 1: **Global welfare changes under Hormuz closure (short run)**



Note: GTAP 11 data; 160 countries; 65 sectors. Conflict-affected countries are not reported (shown with striped shading).
Source: WIFO KITE model results.

[6] Welfare refers to real income or purchasing power, not to well-being in a broader social sense. A welfare loss implies that households and the economy can afford fewer goods and services because prices rise relative to income. It is therefore not the same as a change in GDP.

[7] Conflict-affected economies – Iran, Israel, Iraq, Kuwait, United Arab Emirates, Bahrain, Qatar, Saudi Arabia, Oman, Jordan, and Lebanon – are excluded from interpretation because their outcomes are also dominated by direct war effects rather than trade-channel adjustments only.

Austria in comparison with Germany and the EU

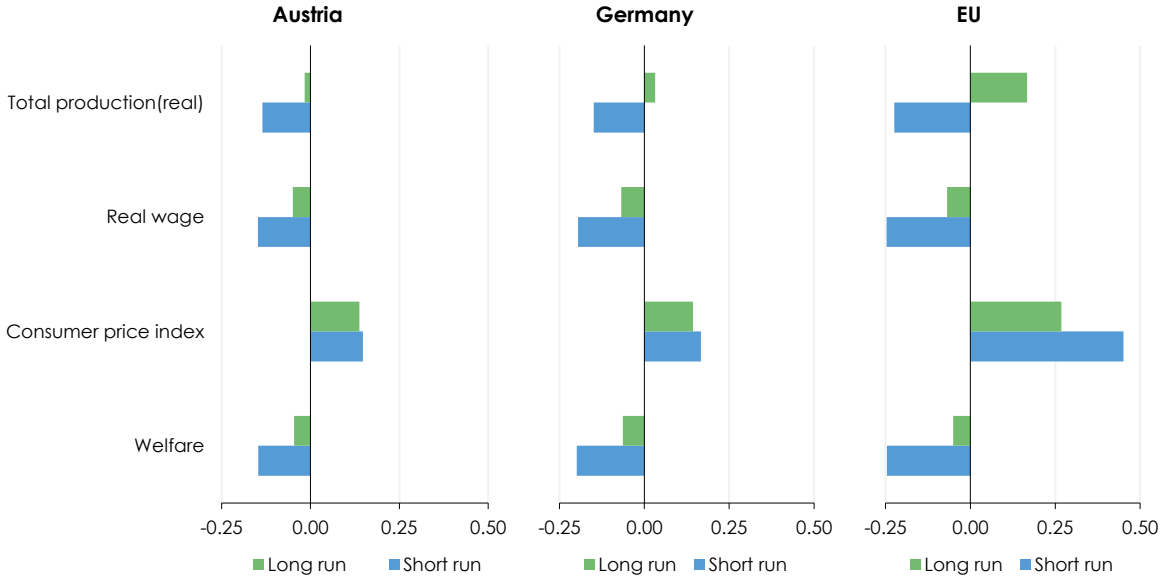
Austria records moderate but clearly negative short-run macroeconomic effects from a Hormuz closure. Welfare falls by 0.15%, real wages decline by 0.15%, total real production drops by 0.14%, and the consumer price index rises by 0.15% relative to baseline (see Figure 2). The pattern is consistent with a classic imported cost shock: higher prices reduce real purchasing power and compress real incomes even where aggregate output losses remain contained.

Germany exhibits a broadly similar impact, but with somewhat larger short-run losses in welfare (-0.2%), real wages (-0.2%) and output (-0.15%). This is consistent with the stronger role of manufacturing and energy-intensive industrial linkages in the German economy. The EU average shows the largest aggregate price response, with consumer prices rising by 0.45% in the short run and welfare declining by 0.25%. Austria therefore appears less exposed than the EU average, but clearly not insulated.

In the long run, losses diminish in all three cases as sourcing patterns adjust, and substitution becomes easier. For Austria, welfare remains 0.05% and real wages 0.05% below baseline, while real production nearly returns to its initial level (-0.02%). Germany also sees substantial attenuation of losses, and the EU aggregate shows the strongest production recovery. The key policy implication is that the immediate adjustment window is considerably more costly than the eventual long-run equilibrium.

Figure 2: **Comparative macro effects for Austria, Germany and the EU**

Percentage deviations from baseline



Source: WIFO KITE model results.

How the shock reaches Austria: the sectoral price cascade

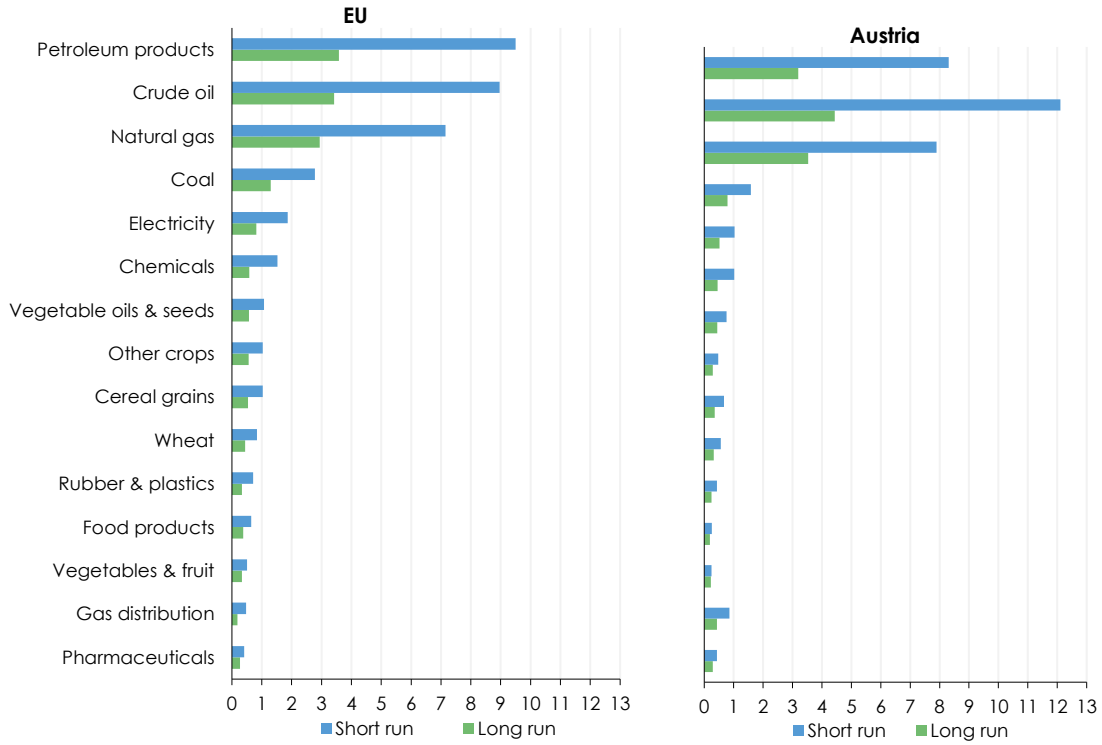
The sectoral results point to a clear energy-led transmission mechanism. In Austria, the largest short-run price increases occur in crude oil (+12.1%), petroleum products (+8.3%) and natural gas (+7.9%), as Figure 3 depicts. These increases are far larger than those observed in

downstream sectors, confirming that the Hormuz shock enters primarily through upstream energy markets.

Relative to the EU average, Austria shows a stronger short-run increase in crude oil prices (12.1% versus 8.9%) and a slightly higher increase in natural gas prices (7.9% versus 7.1%). By contrast, petroleum products rise more strongly in the EU aggregate (9.5%) than in Austria (8.3%). This suggests that Austria's exposure is not uniformly higher or lower than the EU average; rather, it is concentrated in specific upstream segments of the energy shock. Austria's stronger short-run increase in crude oil prices relative to the EU average likely reflects its inland location and more limited logistical flexibility in accessing alternative crude supplies when Gulf exports are disrupted. Compared with larger coastal EU economies, Austria is less directly connected to diversified seaborne import routes and major port-based refinery hubs, so short-run substitution is more constrained, and replacement supplies become relatively more expensive. The EU average also smooths over substantial cross-country differences, including Member States with broader supplier networks and stronger infrastructure options – such as ports, storage, and refinery access – which lowers the aggregate average response. In this sense, Austria's higher crude oil price increase does not necessarily mean it is more vulnerable overall than the EU, but rather that its exposure is more concentrated in the upstream crude oil segment of the shock.

Figure 3: Sectoral price impacts: EU average versus Austria

Percentage deviations from baseline



Note: Ranked according to EU average in the short run.
Source: WIFO KITE model results.

The pass-through into downstream sectors is smaller but still economically relevant. Short-run price increases reach 1.0% in chemicals, 1.1% in electricity, 0.5% in rubber and plastics, and around 0.3% - 0.9% across food-related sectors. These magnitudes are modest relative to energy but remain economically relevant, as they simultaneously affect broad production chains and household consumption while increasing inflation. In the long run, sectoral price effects recede across the board, yet they remain positive, indicating incomplete normalization even after trade reallocation.

Comparison with similar KITE analysis

Compared with the Kiel Institute's bottleneck-based KITE results (Hinz et al., 2026), the present simulation yields smaller losses for the EU (-0.25% short run; -0.05% long run versus -0.40% and -0.12%), China, India, South Korea, and the United States, and a weaker price cascade for crude oil, natural gas, and food. The differences reflect both the shock calibration and the model structure. The Kiel Policy Brief applies a much more prohibitive trade cost shock to Gulf exports and uses the bottleneck extension of KITE, which amplifies scarcity when critical inputs become constrained and strengthens transmission from energy disruptions into chemicals, fertilizers, and food. At the same time, the comparatively smaller effects reported here can be seen as a plausible benchmark for medium-term policy assessment, as they reflect the standard KITE general equilibrium transmission mechanism without imposing additional bottleneck amplification that could overstate short-run scarcity effects. In this sense, the present estimates aim to capture the structural consequences of a Hormuz disruption under observed trade linkages, substitution possibilities, and reallocation across suppliers, rather than a deliberately stress-amplified scenario.

Implications for Austria and the EU

The results indicate that a Hormuz closure is a multi-layered global shock whose burden falls unevenly across countries and sectors. Import-dependent economies are most exposed in the short run, when substitution is limited, and energy costs are transmitted quickly into transportation, inputs, and food prices. For example, in both India and South Korea, energy prices increase by 10% to 30% due to disruptions in the Strait of Hormuz. These higher energy costs lead to a 2% to 3% increase in food prices, including wheat, cereal grains, and other food products, relative to the baseline. In contrast, Austria experiences more moderate effects: we estimate a short-run energy price increase of 7% to 12%, while the food price impacts remain below 0.8%, relative to the baseline, reflecting a clear picture of relatively lower exposure.

For the EU, vulnerability stems less from direct dependence on imports from the Gulf region than from the propagation of the energy price shock through integrated production networks, and the results suggest that long-run adjustment through reallocation and substitution is partial rather than complete. In Austria, it appears primarily as a sustained real income and cost pressure shock imported through global value chains. The short run is the period in which these vulnerabilities are most visible, because adjustment is weakest precisely when the initial disruption is most severe.

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Appendix

Table 1: Welfare changes in the short run in different economies

Country	Percentage change
EU	-0.25
USA	0.004
India	-0.24
China	-0.07
Japan	-0.50
South Korea	-1.03

Source: WIFO KITE model results.