Chokepoints and Inflation Persistence with an Application to the Strait of Hormuz*

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Abstract

A central open question in monetary policy today is how central banks should respond to supply-driven inflation in a fragmented world with repeated negative supply shocks. We propose to answer this question using a global networks approach. In our framework, the inflation dynamics generated by a supply shock depend on the structure of the global production and trade network. We apply this framework to the 2026 closure of the Strait of Hormuz, which shut a chokepoint that normally carries roughly a fifth of world oil consumption and raised oil prices by about 64 percent. This shock fits our global networks approach: it is a "chokepoint shock," defined as a temporary quantity restriction on trade flows through a single node of the global network. We characterize where such a shock coincides with familiar formulations - an iceberg trade cost, a tariff, a sectoral cost-push shock - and where it departs from them. We show how such a blockade on a critical node transmits through global network linkages to U.S. inflation, output, consumption, and the dollar using a multi-country, multi-sector New Keynesian open-economy-network model with incomplete financial markets. Preliminary results from a first implementation of the closure as an export-tariff wedge deliver a persistence multiplier for the United States - a shock with a half-life of roughly three quarters generates inflation dynamics that play out over twelve to sixteen quarters - and a global stagflationary impulse with sharply uneven incidence.

1 Motivation and Question

The July 2026 FOMC statement attributes elevated inflation in part to "supply shocks that have driven price increases in certain sectors, including energy" (Federal Open Market Committee, 2026), and the 9–3 vote - with three dissenters preferring an immediate rate increase - reflects the unresolved question of how persistent the inflation coming from these supply shocks will be. The implications of a look-through policy depend on exactly that persistence. Kalemli-Özcan et al. (2025) demonstrate that when input-output linkages interact with sectoral nominal rigidities, even one-time, temporary tariff shocks generate

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persistent inflation-output dynamics absent from standard New Keynesian benchmarks; the same mechanism applies to the supply shocks the FOMC confronts today. This continues an argument we made at the ECB's Sintra Forum in 2022 - before the energy narrative took hold - that pandemic-era inflation originated in global supply networks and would prove more persistent than the "transitory" view implied (di Giovanni et al., 2022; Çakmaklı et al., 2025). We use our global networks framework to study this issue and apply it to the 2026 closure of the Strait of Hormuz.

Why do we pick this particular application? Our argument is that the repeated negative supply shocks that the FOMC refers to are not regular productivity or commodity-price shocks but rather what we call "chokepoint shocks": temporary quantity restrictions on the flows between nodes of the global trade network. Many countries are turning more protectionist to stop a rising China, practicing economic statecraft (Clayton et al., 2025) and creating a proliferation of chokepoint shocks. These chokepoint shocks are not aggregate shocks - each concerns a certain sector, a certain transit route, or a certain production factor - yet they can have important aggregate implications for domestic macroeconomic outcomes even for relatively closed economies such as the U.S.

In early 2026, the war with Iran closed the Strait of Hormuz; the closure has persisted episodically since - an April ceasefire collapsed within ten days, and attacks on shipping resumed in July. About 20 million barrels per day of crude and products - roughly a fifth of world oil consumption - normally transit the strait (U.S. Energy Information Administration, 2026b,c); net of pipeline bypass, the closure disrupted 11–14 million barrels per day at its peak (U.S. Energy Information Administration, 2026c; International Energy Agency, 2026), roughly an eighth of world oil consumption. Brent rose from $61 per barrel at the start of the year to $72 on the eve of the closure, crossed $100 within two weeks, averaged $103 in March, and peaked at $118 at the end of March - an increase of 64 percent over the pre-closure price (U.S. Energy Information Administration, 2026a). Prices receded as shipments partially resumed, before surging back above $100 in late July as attacks intensified. Freight and war-risk insurance premia on affected routes added at most about 15 percent to the value of shipped cargo in ad-valorem terms: war-risk premia peaked at 7.5–10 percent of hull value and Persian Gulf–China crude freight at roughly $11 per barrel (S&P Global Commodity Insights, 2026). We ask how such a blockade impacts macroeconomic variables globally - inflation, real GDP, consumption, and exchange rates - not only for the United States, but also for Europe, China, the oil producers, and the rest of the world. Three features of the episode make it the ideal laboratory for our model, and these features discipline how one should think about the answer to the question we posed in the introduction. First, the shock is transitory and was understood to be transitory (the EIA's July outlook has shut-ins

falling to 1.4 million barrels per day by the fourth quarter of 2026, U.S. Energy Information Administration, 2026c), so its inflationary impact depends on how nominal rigidities and input-output linkages convert a temporary cost impulse into persistent price dynamics; this is precisely the propagation mechanism that monetary policy cannot simply undo in a network economy. Second, oil trades in dollars and the shock redistributes wealth toward energy exporters, so incomplete financial markets and the resulting risk-sharing wedge, not just relative prices, determine who bears the burden. Third, the observed cost of moving oil rose far less than its price, so the shock is a quantity restriction with a large shadow price, not a resource cost.

2 Framework: A Blockade as a Chokepoint Shock

We use the N-country, J-sector New Keynesian open-economy-network model of Kalemli-Özcan et al. (2025): global input-output linkages calibrated to the OECD ICIO, sector-specific nominal rigidities, dominant-currency pricing, and incomplete markets with a single dollar bond. Two objects organize the transmission. The risk-sharing wedge measures the shock-induced wealth transfer across countries relative to the complete-markets benchmark and moves consumption and exchange rates independently of output. The New Keynesian open-economy (NKOE) Leontief inverse governs how sectoral cost distortions propagate and persist: with more sectoral prices than policy instruments, inherited relative-price misalignments survive as endogenous states, so transitory shocks generate persistent inflation-output dynamics (Rubbo, 2023; Pasten et al., 2020). Relative to the growing macroeconomic literature on tariffs (Auclert et al., 2025; Itskhoki and Mukhin, 2025; Werning et al., 2025) and to quantitative trade frameworks with input-output linkages (Caliendo and Parro, 2015; Baqaee and Farhi, 2024), the blockade experiment stresses precisely the two ingredients our framework adds: nominal rigidities that interact with the global network, and the incomplete-markets wealth transfer.

In the model, the closure of the Strait of Hormuz is a chokepoint shock: a temporary quantity restriction on the energy flows between the oil-producer bloc and the rest of the network. How best to represent such a restriction, and to what extent its effects can be replicated by an iceberg cost, a tariff, or a sectoral cost-push shock, is itself part of what we propose to study: classic equivalence results between quantity restrictions and tariffs come from static trade settings and need not survive in a dynamic sticky-price network economy with incomplete markets, where these formulations differ in their terms-of-trade and valuation effects through the balance of payments and hence in the risk-sharing wedge they generate.

For the preliminary exercise reported below, we begin with the simplest implementation: a large export-tariff wedge on all cross-border energy trade, where buyers pay the wedge-inclusive price and the wedge revenue accrues to the exporting bloc. The episode itself disciplines this choice. An iceberg formulation would treat the disruption as a resource cost, but measured transit costs added at most about 15 percent in ad-valorem terms while prices rose 64 percent (S&P Global Commodity Insights, 2026; U.S. Energy Information Administration, 2026a); the closure instead acted as a quantity restriction whose scarcity rent accrued to inframarginal sellers able to reach the market. The export-tariff wedge is a first, model-consistent implementation of that shadow price. We redefine the blocs to isolate the energy dimension of the world economy: the United States, Europe, China, an oil-producer bloc comprising the eleven major producers the ICIO identifies individually, and the rest of the world, with energy separated as its own sector and retail import sectors as in the framework paper.

The calibration philosophy targets the episode's two observables. The wedge's size and its perceived persistence are free parameters, and we discipline them jointly by requiring the model's world oil price to match the observed 64 percent peak increase over the pre-closure price and the disrupted quantity to match a target of 13 million barrels per day, within the observed peak-disruption range of 11–14 million barrels per day (U.S. Energy Information Administration, 2026a,c; International Energy Agency, 2026). The benchmark reported below fixes the wedge at 100 percent with an AR(1) persistence of 0.8, a half-life of roughly three quarters; the joint price-quantity calibration is part of the proposed work.

3 Preliminary Results

Table 1 reports on-impact responses in the benchmark; Figure 1 plots the paths of inflation, real GDP, and consumption. Three findings stand out; all are preliminary, from the first-order solution of the model.

First, the blockade is a stagflationary impulse for most of the world, with sharply uneven incidence. Inflation rises on impact by 0.5 to 0.6 percentage points in the United States, Europe, and China while output falls in most blocs, and the dispersion is large: oil-producer output collapses by 3.5 percent as export volumes are choked off, while their consumption *rises* by 0.4 percent, financed by scarcity rents. Output and consumption moving in opposite directions for the same bloc is the risk-sharing wedge at work, and it is a pattern that complete-markets or one-sector models counterfactually mute. Europe suffers the largest consumption decline, 1.3 percent, alongside a 1.8 percent depreciation of the euro against the dollar and the sharpest real-wage decline. The incidence is also long-lived: oil-producer

output and consumption remain visibly away from steady state at the ten-year horizon in Figure 1, consistent with the slow unwinding of revalued net foreign asset positions under incomplete markets; the proposed work will characterize this near-permanent legacy of a transitory shock.

China's real GDP *rises* by 0.6 percent on impact even as its consumption falls; the proposed work will decompose this response, with expenditure switching and the redirection of energy trade among the candidate channels.

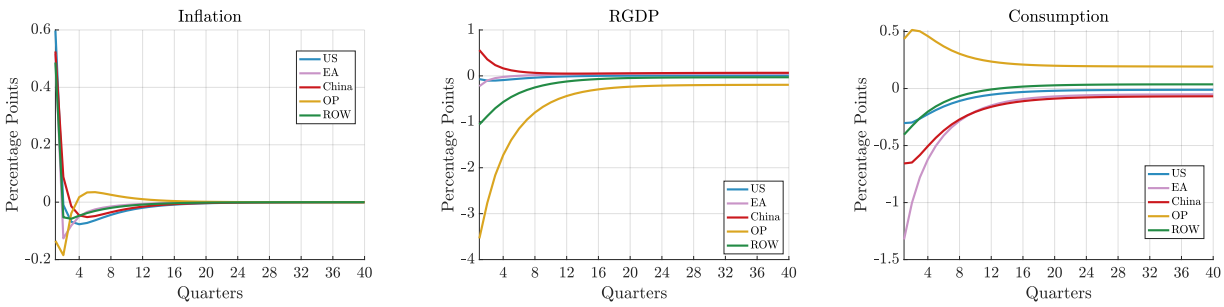
Second, the temporary shock produces a persistence multiplier. A closure with a half-life of roughly three quarters generates inflation dynamics that play out over twelve to sixteen quarters; the duration mapping in Section 4 is designed to isolate the network's contribution to this horizon. Inflation is positive while the constraint binds, reverses sign as the wedge decays, and the price level largely round-trips. The round-trip sharpens the policy question rather than resolving it: a price-level targeter can rationally look through this shock, but an inflation targeter faces three to four years of sign-switching deviations from target.

Third, none of the U.S. inflation response reflects an endogenous monetary reaction. We hold the U.S. policy rate fixed in the benchmark by construction - itself an accommodative stance, since the real rate falls on impact - precisely to isolate the network's contribution, while foreign policy rates respond endogenously (the euro-area rate rises by 52 basis points). The persistent U.S. inflation in Figure 1 is therefore what the network produces on its own - the propagation that a look-through policy would be accommodating.

Table 1. On-impact responses to the Hormuz blockade benchmark

	US	EA	China	OP	RoW
Real GDP, $RGDP_n$	−0.07	−0.22	0.56	−3.54	−1.06
Consumption, C_n	−0.30	−1.32	−0.66	0.43	−0.40
Inflation, π_n	0.60	0.52	0.53	−0.13	0.49
Policy rate, i_n	0.00	0.52	0.11	−0.03	0.10
Depreciation vs. USD, $\Delta\mathcal{E}_n$	0.00	1.83	0.31	0.30	0.54
Real wage, W_n/P_n	−0.68	−2.87	−0.75	−2.67	−1.87
Net exports, $NX_n/NGDP_n$	−0.19	−0.76	−1.23	3.38	0.47

Note: First-order solution. Benchmark: 100 percent export-tariff wedge on all cross-border energy trade, AR(1) persistence 0.8. Entries are percent deviations from steady state (percentage points for inflation and policy rates). $\Delta\mathcal{E}_n$ is the on-impact depreciation of bloc n's currency against the dollar. OP is the oil-producer bloc; wedge revenue accrues to the exporting bloc. Preliminary.



(a) Inflation **(b)** Real GDP **(c)** Consumption

Figure 1. Responses to the Hormuz blockade benchmark

Note: First-order impulse responses to the benchmark shock of Table 1, in percentage points, quarterly. Preliminary; figures will be updated as the calibration is finalized.

4 Next Steps

Our proposed next steps have six components: sharpening what makes a chokepoint shock distinct, refining the energy block and its elasticities, improving the country aggregation, mapping shock duration into inflation persistence, characterizing optimal policy, and isolating the contribution of incomplete markets.

What is distinct about a chokepoint shock? Section 2 poses the question of how a quantity restriction on trade through a single node relates to a tariff, an iceberg cost, and a sectoral cost-push disturbance. We propose to answer it by running the same disruption implemented several ways and asking where the propagation separates. Under the current implementation these formulations are close to observationally equivalent in relative prices, and the export-tariff wedge is exactly the instrument that reproduces the observed quantity reduction, so the difference must come from elsewhere: from where the scarcity rent accrues and how it is redistributed, from the fact that the restriction is bilateral and node-specific rather than uniform across a sector, and from whether the resource is destroyed or merely reallocated. The first is a wedge-and-accounting distinction, the second a network-topology distinction, the third shows up in the balance of payments. The implementations are an export-tariff wedge, an import tariff, an iceberg cost, and a sectoral productivity shock calibrated to the same on-impact oil price; we will report where the inflation, output, consumption, and exchange rate paths separate and where they do not. Our conjecture, to be tested, is that the chokepoint implementation delivers more inflation persistence than the equivalent uniform cost-push shock because the restriction binds on specific bilateral links and forces reallocation across the network rather than a common shift in marginal cost. This connects to Bai et al. (Forthcoming), whose measured disruptions are port congestion and

shipping delays, a transport and capacity friction rather than a quantity restriction on a particular network linkage, and to Comin et al. (2023), whose occasionally binding capacity constraints operate at the sector level rather than on bilateral flows.

Energy block and elasticities. Three refinements to the calibration. First, we will split oil into domestically produced and imported varieties so that a disruption to transit does not mechanically shut down domestic production; in the current single-sector implementation a supply shock to oil contaminates the domestic barrel counterfactually. Second, in a system with a single mobile factor the model responds to an oil price increase by drawing labor and intermediates into oil production, which understates the constraint; we will assign a sector-specific factor to oil, or equivalently restrict factor mobility into it, so that the quantity restriction is genuinely binding. Third, the elasticity structure of the intermediate bundle matters for exactly this reason: substitution across sectors is low while substitution within a sector across origins is high, and treating oil symmetrically with other intermediates makes it too easy to substitute away. We will report the Cobb-Douglas case as the benchmark, since it is the standard in the trade literature, alongside a complementary case that places oil closer to Leontief with respect to the remaining intermediate bundle, and use the pair to bound the response.

ICIO aggregation. The current bloc structure is limited by the ICIO's own coding. The 2025 edition identifies the United Arab Emirates and Saudi Arabia individually, but Iran, whose action generated the shock, along with Iraq, Kuwait, Qatar, and Oman, remains inside the rest-of-the-world aggregate. We will construct an explicit Middle East geography as a bloc, in the spirit of the country cuts used in Kalemli-Özcan et al. (2025), and check the sensitivity of the results to how the residual is allocated. The 2025 edition also expands mining to its 2-digit ISIC divisions, separating extraction of crude petroleum and natural gas from coal and metal ores; together with the separately identified pipeline and water transport sectors, this allows the disruption to be applied to oil transit rather than to oil production, which is closer to the economics of a chokepoint closure than the single-sector implementation used here.

Duration and persistence. The benchmark fixes the wedge at 100 percent with AR(1) persistence 0.8. Rather than treat this as a single scenario, we will parametrize the closure by the number of quarters the constraint binds, from a one-quarter on-off shock through the observed duration and beyond, and trace out how cumulative inflation and its half-life vary with that duration. This is the object of policy interest: a one-quarter closure is the cleanest

test of whether look-through is justified, since any inflation surviving beyond the shock is produced by the network rather than by the shock itself. Alongside this we will complete the joint calibration of the wedge size and its persistence so that the model matches both the observed price increase and the observed disrupted volume, rather than the price alone.

Optimal policy. With the shock-type comparisons and the duration mapping in hand, we will characterize the optimal degree of look-through as a function of network structure, with welfare comparisons across inflation-targeting and price-level-targeting rules. The round-trip in the price level makes this contrast the natural one: a price-level targeter is vindicated by construction if the level returns, so the question is what the network does to the welfare gap between the two rules.

The role of incomplete markets. We will assess the sensitivity of the incidence results to the risk-sharing wedge by nesting the complete-markets benchmark, quantifying how much of the uneven incidence, and of the long-lived divergence in oil-producer output and consumption, is attributable to incomplete markets rather than to relative prices alone.

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