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Geopolitical Supply Disruptions as Macroeconomic Shocks: Effects of a Strait of Hormuz Blockade and a Rise in Crude Oil Prices to \$112.57 on the Indian Economy An econometric and policy viewpoint in its totality.

--Tanush Tiwari



Abstract

Geopolitical risks of dependency on essential energy transit chokepoints are threatening for import dependent emerging economies. This is an attempt to ascertain the structural and macro-economic consequences that a severe disruption of the Strait of Hormuz will have on the Indian economy. A complete blockade scenario would result in an increase in Brent crude oil prices from \$72/barrel to \$112.57/barrel, indicating a spike of 55.3%.

This is significant, as approximately 20% of global petroleum liquids consumption and over 20% of global LNG trade passes through this critical transit choke-point.

Given that, India is highly dependent (over 85%) for almost every unit of crude oil it consumes, and about half of the natural gas it needs, a crisis scenario will create interruptions across a majority of Indian economy sectors. This research has constructed a framework analysis to trace down immediate and secondary consequences on 5 major Indian macroeconomic variables (balance of payments, domestic price stability, fiscal space, monetary policy and the status of money and capital markets). The policy response required should encompass measures like raising the SPR, establishing non-dollar trade facilities, expediting the green hydrogen production and its adoption in the Indian context and diversifying the transit routes.

1. Introduction and Theoretical Background

The ability to achieve continued growth relies heavily on the stability of their primary energy supply chains. For emerging market economies, growth in gross domestic product and growth in energy demand are highly correlated and to an extent mutually reinforcing. An economy that needs imported foreign energy for growth becomes inherently unstable to macroeconomic shocks caused by external pressures. The Indian case of such structural fragility and vulnerability to such shocks can clearly be demonstrated, as the country meets in excess of 85% of its crude oil demand from abroad and more than 50% of the demand for natural gas it currently requires, thus making it third on the list of top crude oil consuming nations globally.

Existing Literature on this topic, such as Hamilton (1983) and Kilian (2009) have looked into the relationships between oil shocks and macroeconomic variables. The consensus in existing Literature is to describe an oil shock as something that shifts the aggregate supply inwards, thereby inducing

factors such as reduced productiveness, increasing marginal cost, and altering of the country's terms of trade and on a purely structural estimation, increases in price of imported raw materials will mean the economy is faced by inwards shifts of the SRAS, creating a "stagflationary" process characterized by reduction of real GDP and increasing prices. In an environment of 6.5-7% steady GDP growth the speed of a structural price change like this will lead to rapid decline in consumption margins, volatilities in fixed income securities and shifting of patterns of capital accumulation.

$$\text{Terms of Trade (ToT)} = P_{\text{exports}} / P_{\text{imports}}$$

With an exogenous 55.3 % surge in oil prices, P_{imports} would increase drastically; term of trade would drop dramatically causing an immediate transfer of wealth from the oil importing nation to the oil-exporting nations, reduces the real domestic income of the importing country and creates cost-push inflation. In this paper we try to further develop the standard classical transmission mechanisms, through the inclusion of a structural shock i.e. a prolonged disruption of the Strait of Hormuz.

Unlike the oil shock 1973, 1979, and 1990 (result of quotas, embargo or war) the current Strait closure would lead to "physical necessity and speculative financial premia".

With an increase in the price of oil to \$112.57 per barrel following the disruption of a chokepoint carrying roughly 20% of global petroleum liquids consumption, this paper examines the sustainability and elasticity of the economy of India.

2. The Geopolitical Crucible: Mechanics of the Strait of Hormuz Closure

The Most Important Artery For Energy In the World Is the Strait of Hormuz The strait connects the Persian Gulf to the Gulf of Oman and to the Arabian Sea, and it lies between the Islamic Republic of Iran on the north and Oman on the south. The strait is the narrowest strait for shipping for navigation where there are two miles of shipping lanes with 2 miles on one direction and with 2 miles for other direction ships, with 2 mile space in between; so because of its physical constraints it will not allow easy traffic reorganization solutions, which means that every closure will trigger a real energy problem.

Metric	Volume / Percentage Impact	Economic Significance
Daily Oil Transit	20–21 Million Barrels Per Day (mbpd)	Equal to roughly 20% of global petroleum liquid consumption.
LNG Disruption	80 billion cubic meters (bcm) annually	Represents over 20% of global liquefied natural gas trade, primarily from Qatar.
Baseline Crude Price	\$72.00 per barrel	Stable market equilibrium reflecting balanced global supply-demand dynamics.
Shock Peak Price	\$112.57 per barrel	A 55.3% increase driven by panic buying, insurance premium spikes, and structural scarcity.

With the shuttering of the choke point we will see global energy move from price elastic to very inelastic. The premium for marine war risk surcharges increases by the order of orders of magnitudes

in mere hours when this occurs. This will not only increase the prices of crude grades imported by countries other than those located in the Middle East but will also push up the prices of non-Middle Eastern crude grades because of arbitrage and global demand dislocation. In case of India, its geographical location makes more than 60 percent of its crude imports vulnerable to this geography.

3. Global Macroeconomic Impact of the Brent Crude Shock

The abrupt shut down of the Strait of Hormuz has brought about a disruptive effect on the global energy architecture. As one of the key bottlenecks in the global energy market, the abrupt shutdown has led to a disruption of a chokepoint carrying roughly 20% of global petroleum liquids consumption and over 20% of global LNG trade. The immediate market response to such a phenomenon has been a spike in prices where Brent crude rose by 55.3%, rising very quickly from \$72 to \$112.57 per barrel. This price instability and disruption of the supply of vital energy products has brought about major macroeconomic shocks around the globe, leading to synchronized slowing down of growth, inflationary pressures, and balance-of-payment crises of countries that are highly dependent on imports. This essay discusses how the above shocks are affecting the global economy continentally and sector-wise.

3.1 Anatomy of the Supply Shock

Strait of Hormuz may rightly be labeled as the world's most vital energy choke point. This specific choke point removes millions of barrels of oil daily from the market plus enormous quantities of Qatar's LNG. Contrary to those supply led oil price rises during good times due to market demand, this is a giant and immediate regressive tax on consumers and industry. The price of Brent crude rises 55.3%, there is a physical bottleneck to supply and this requires states to use their Strategic Petroleum Reserve (SPR) extensively and source oil from various other expensive alternatives.

3.2 Continent-by-Continent Impact Analysis

Asia-Pacific: Imported Products are Most Vulnerable

Asia-Pacific: the continent that relied heavily on the importing of oil and LNG from the Middle East is the most damaged by this shock.

China: The world's biggest importer of oil faces a huge cost inflation from this shock. Although long term contracts and diversity of import source (Russian over land pipeline) are mitigating factors but the large scale reduction of seaborne oil will put immense pressure on its oil refineries and production costs. This increase in Producer Price Inflation will spread further to export prices leading to global inflation.

India: Being dependent on more than 80% of its crude oil needs from imports, India is facing the situation of high inflation and quickly increasing CAD of its economy due to this shock. The shock causes depreciation of Indian Rupee vis-à-vis US Dollar and increase cost of its entire imports. Fiscal burden of subsidy and negative impact on consumption badly affect economic growth projections of India.

Japan and South Korea: Being highly dependent on imported energy needs (LNG), the shock has posed threat to their manufacturing sector and production. Japanese economy has faced increase in import bill, worsening its trade deficit whereas rise in cost of LNG has raised electricity costs.

Europe: Compounding Industrial Strain

Europe is currently experiencing difficulties, especially since the continent needs to reshape its energy chain from being dominated by Russia.

The Eurozone: A 55.3 per cent rise in the price of Brent crude will undoubtedly act as a major stagflationary influence. A tough margin squeeze condition will be present for the highly energy dependent German and Italian manufacturing sectors and it will call for cuts in production. The European Central Bank is faced with the dilemma that it must fight against the headline rises of inflation that are due largely to the price of energy but at the same time it must avoid pushing a consumer who has lost considerable purchasing power into recession.

The UK: In the UK there are also obvious signs of stagflation. Inflation is increasing in line with the general cost of living and this is amplified by the record prices for gasoline. Even though the UK has some indigenous fuel sources in the North Sea this is unlikely to help defend the country from price rises on an international level.

North America: The Producer-Consumer Divide

In North America, there will be highly bifurcated effects that depend on domestic energy production status. In the USA There will be a severely negative impact in this aspect of effects in the USA for the country and the consumer while that could be positive for us crude and for large us companies that want investment in crude oil or an increased ability to export US oil while prices are \$112.57 per barrel while this means there is money coming in in order to increase investment; however this is bad for most consumers with gas prices increasing and hurting retail purchases along with sentiment to and it also causes for higher fed interest rates which risk making it a harsh economic landing. Canada Since the nation is an energy export nation there has been a boost in trade and an increase in revenue that pours in toward Canada and strengthen Canadian dollar. However the appreciation in USD in relation to Canadian Dollars will make it harder for non-crude sectors of the Canadian economy in Ontario and in Quebec.

Latin America: Exporter Windfalls vs. Importer Crises

That said, within the Latin American region we can undoubtedly distinguish two categories according to the outcome derived from their macroeconomic figures: – Net exporters: i.e. Brazil, Colombia and Guyana. These economies will experience the immediate impact of an improved fiscal and external account i.e.

As in the case of Brazil, the revenues provided by Petrobras provide the government with extra margins so that it may make use of its budgetary capacity – but face the adverse consequences of inflation induced by high energy costs at home and a stronger exchange rate, as derived from the impact known as «Dutch Disease.». – Net importers: the central American countries, together with Peru and Chile.

The latter countries are hit hard by a severe deterioration in their terms of trade. Chile, for example, depends on energy imports to sustain the large productive capacities of its copper mines, and the resulting increase in energy costs raises the cost per unit of production.

Africa: Fiscal Relief for Few, Hardship for Many

Most of Africa stands in marked contrast to a small few producers that are short of energy. The Main Producers (Nigeria, Angola, and Algeria): Their oil export earnings will increase, relieving the chronic Foreign Exchange Gap and budgetary shortfall of oil producers. Inability to produce crude domestically in Nigeria means that crude exports will be offset by expensive purchases of refined products.

Rest of Africa: The other African nations are in disaster due to the change in the situation.

The rise in prices caused increase of food transport cost (food shortage and inflation problem will worsen) and increase of other prices as imports were made more expensive in foreign exchange terms (hopelessly indebted nations may face national default).

3.3 Broad Sectoral and Trade Implications

The 55.3% increase in oil prices changes the dynamics of international commerce and heavy industry. The logistics and international transport industry is hit by the rise in the price of bunker fuel. This will necessitate increases in freight rates, thus making the transportation cost of international commerce even more expensive. Aviation, which is faced with a dire profit crisis, has its operations made difficult owing to high-priced jet fuel.

There is no doubt that agriculture, too, is affected by the increase in oil prices. Modern agricultural practices consume large amounts of oil in the operation of machinery and natural gas to make fertilizer. The increase in both oil and LNG prices makes food production more expensive, hence increased food prices around the world.

3.4 A Persistent Stagflationary Threat

The closure of the Strait of Hormuz and the subsequent spike of Brent crude to \$112.57 per barrel represent a textbook supply-side macroeconomic shock. By simultaneously depressing global economic output and aggressively driving up inflation, it thrusts the global economy into a state of stagflation. The sheer magnitude of the disruption—affecting a chokepoint carrying roughly 20% of global petroleum liquids consumption and over 20% of global LNG trade—ensures that the economic scars will be deep and long-lasting. Policymakers worldwide are left with few good options, forced to navigate the treacherous path between triggering deep recessions through high interest rates or allowing inflation to become deeply entrenched in the global economic system

4. Macroeconomic Transmission Channels to the Indian Economy

- Oil price shock of 55.3%, transmitted through the Indian economy, is non-linear and works through three main layers.
- Direct Transmission Channels: Outflow of foreign currency reserves to meet the higher-cost energy imports. Increase in domestic prices for petrol, diesel, ATF, leading to lower discretionary consumption power of consumers.
- Indirect Transmission Channels: Oil products are used as an input factor for manufacturing of pharmaceutical products, plastic, fertilizer, and paints. As a result of this, higher prices lead to decreased GVA in manufacturing sectors. More than 70% of India's internal freight is moved by road using diesel-powered transport. Increased price of diesel means the increase of all costs of transportation of goods, including agricultural products.
- Second-Round Policy Transmission Channels: In order to keep anchored inflation expectations, RBI adopts a hawkish policy, increasing the repo rate and decreasing system liquidity. Change in global market risks results in outflow of capital from oil-sensitive EM economies into safe haven assets (U.S. Treasuries, Gold).

5. Impact Analysis on Primary Macroeconomic Indicators

5.1 Current Account Deficit (CAD) and Balance of Payments (BoP)

The structural balance of India's trade architecture is sensitive to energy pricing. However, empirical thumb rules based on past experience suggest that for every \$10 rise in the price of Brent Crude oil, there is an increase of around 0.4% to 0.5% of GDP in India's Current Account Deficit. For prices varying from \$72.00 to \$112.57, there is an increase of \$40.57 in price per barrel. This results in an approximate 1.6% to 2.0% widening of the CAD as a percentage of GDP.

This structural expansion creates an absolute deficit in the net balance of payments unless matched by equivalent capital account inflows. Given that capital accounts typically experience contractionary shifts during geopolitical escalations, the net BoP swings into deep deficit, requiring direct policy mediation via foreign reserve draws.

5.2 Inflationary Dynamics (WPI, CPI, and Core Pass-Through)

The inflationary pressures are expressed through a two-tier mechanism. For one, the Wholesale Price Index (WPI) is quick to reflect the 'Fuel and Power' basket change. Second, they are passed on in the Consumer Price Index (CPI). Crude prices have risen by 1% due to the direct impact of a 10% rise and by 0.25%–0.35% due to the indirect impact on CPI, historically. A \$112.57/bbl price situation prevailing for a while could add about 1.2% to 1.5% to India's headline CPI, potentially pushing inflation toward or above the RBI's upper tolerance limit of 6%, depending on the prevailing baseline rate.

There are second-round effects that are more insidious on core inflation. Fuel surcharges by industrial transportation companies make the prices of consumer non-durables, foodstuffs and services more expensive, and, with lower crude prices, the cost structures are difficult to lower.

5.3 Fiscal Stress, Subsidies, and Public Debt Architecture

The Fiscal Challenge: The government needs to decide whether to bear the price shock either by reducing excise duties and raising subsidies (fiscal deficit), or pass through completely to consumers (impact on GDP and consumption).

Even just half of the \$40.57/bbl increase, if the government decides to absorb it to protect consumers, is a huge fiscal burden. Fiscal bailout or subsidy transfers are needed for under-recoveries of State Owned Oil Marketing Companies (OMCs) which draw funds from planned investments in infrastructure and affect the fiscal deficit consolidation target.

The government borrowing programme inevitably assumes greater importance with the existence of a structural deficit for a long time. Domestic bond yields are being pushed up by the additional issuances of sovereign G-Secs and consequently the cost of capital is being pushed up across the corporate pyramid which has a crowding out effect on private sector investment.

5.4 Currency Vulnerability and RBI Foreign Exchange Interventions

The higher energy bills come with dollars exodus, which tips the demand-supply equation in favour of the dollar. The currency is coming under pressure, with its lowest value ever before. To control high volatility and imported inflation, the RBI has to use its foreign exchange reserves which will lead to a reduction in liquidity and a contraction of the import-cover runway.

Central bank's sterilisation operations in the course of managing domestic liquidity can affect the monetary transmission channels, which may lead to higher call money rates in the interbank market in the short-term and higher lending rates in retail banks.

6. Microeconomic Impact: Industry-Specific Capital Erosion & Volatility

- Beyond the macroeconomic indicators, the switch from \$112.57/bbl oil influences sector-specific business profitability trends in Indian equities:
- Aviation: Aviation Turbine Fuel (ATF) constitutes between 40%-45% of the total operational expenses of an airline company. The increase of 55.3% in crude prices results in a 35%-40% rise in ATF prices, thus reducing margins and causing hike in air tickets prices.

- Paints & Petrochemicals: Derivatives of crude oil (such as Phthalic Anhydride and Titanium Dioxide Solvents) form around 50% of the cost of raw materials for paint manufacturers. Margins come under pressure if these costs are not passed on to the consumers.
- Automotive: Increase in fuel price increases the total cost of ownership (TCO) of Internal Combustion Engine (ICE) cars, and hence reduces demand in lower passenger and two wheeler segments.

7. Policy Interventions and Strategic Recommendations

- 1. Strategic Petroleum Reserve (SPR) Optimization: India's current SPR capacity holds roughly 5.33 million metric tons (MMT), providing around 9.5 days of crude coverage. Policy priority should be directed toward completing Phase II expansion projects (adding 6.5 MMT at Chandikhol and Padur) to extend total emergency import cover beyond 30 days.
- 2. Alternative Settlement Architecture: Building on existing institutional frameworks, India should expand bilateral non-dollar settlement mechanisms (e.g., INR-Dirham or INR-Ruble architectures) to purchase energy from non-Hormuz suppliers, reducing direct vulnerability to Western-cleared clearing networks during crises.
- 3. Accelerated Energy Substitution: The structural solution to import dependency is reducing oil usage. Policy backing must aim at promoting the development of green hydrogen nationally, raising ethanol blend to 20%, and building up EV charging stations to separate domestic transportation from international oil prices.

8. Long-Term Structural Alternatives and Geopolitical Shifts

To insulate the macroeconomic architecture from recurrent chokepoint vulnerabilities, strategic long-term planning must reorient toward continental and oceanic alternative corridors. The expansion of international north-south transit pathways and specialized cross-border pipeline connections with Central Asian producers provides structural insulation.

At the same time, the geopolitical realignment in the context of global partnerships calls for trade models that formalize energy security. A diversification of the crude refining base beyond the highly concentrated maritime chokepoints eliminates potential vulnerabilities to system shutdowns.

9. Important Graphs and Data:

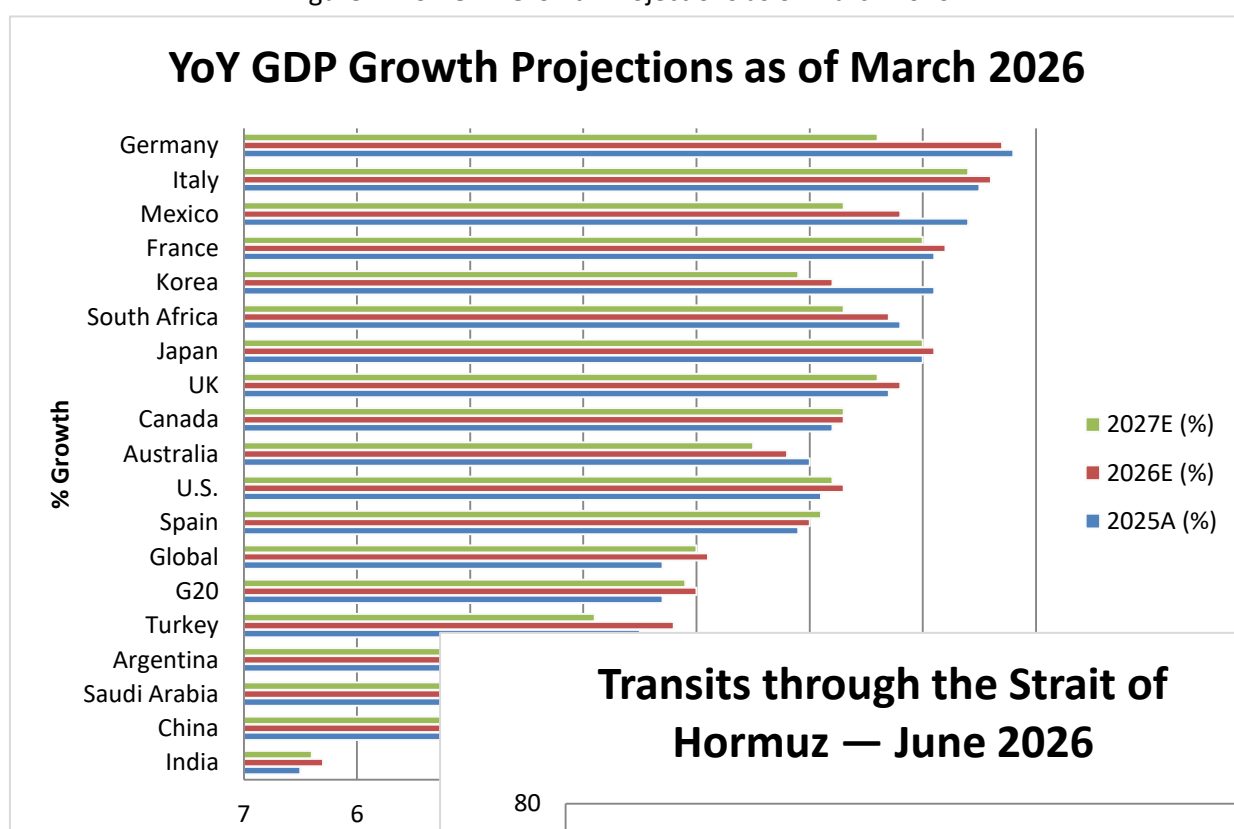
- YoY GDP Growth Projections (as of March 2026)

Country/Region	2025A (%)	2026E (%)	2027E (%)
India	6.5	6.3	6.4
China	5	4.3	4
Saudi Arabia	4.5	3.7	3.6
Argentina	4.4	3.9	3.6
Turkey	3.5	3.2	3.9
G20	3.3	3	3.1
Global	3.3	2.9	3
Spain	2.1	2	1.9
U.S.	1.9	1.7	1.8
Australia	2	2.2	2.5

Canada	1.8	1.7	1.7
UK	1.3	1.2	1.4
Japan	1	0.9	1
South Africa	1.2	1.3	1.7
Korea	0.9	1.8	2.1
France	0.9	0.8	1
Mexico	0.6	1.2	1.7
Italy	0.5	0.4	0.6
Germany	0.2	0.3	1.4

Note: A = Actual, E = Expected. Ranked by 2025 GDP. Values below are visually estimated from the source bar chart (only the 'Global' row carried explicit data labels: 3.3% / 2.9% / 3.0%) treat as approximate and verify against the original OECD/Howden report for precision.

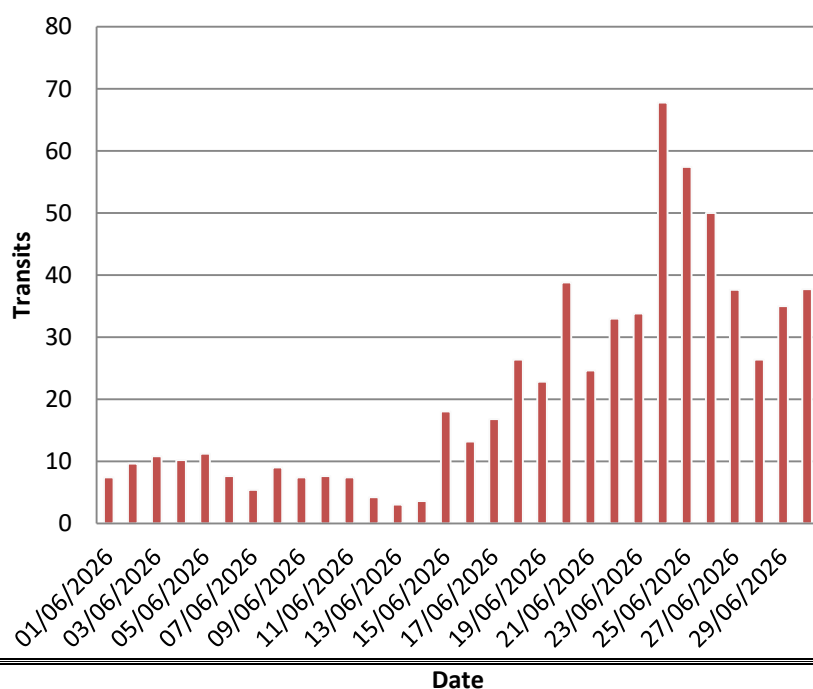
Figure 1: YoY GDP Growth Projections as of March 2026



- Transits Through the Strait of Hormuz — June 2026

Date	Transits (vessels)
01/06/2026	7.4
02/06/2026	9.6
03/06/2026	10.8
04/06/2026	10.2
05/06/2026	11.2
06/06/2026	7.6

Transits through the Strait of Hormuz — June 2026



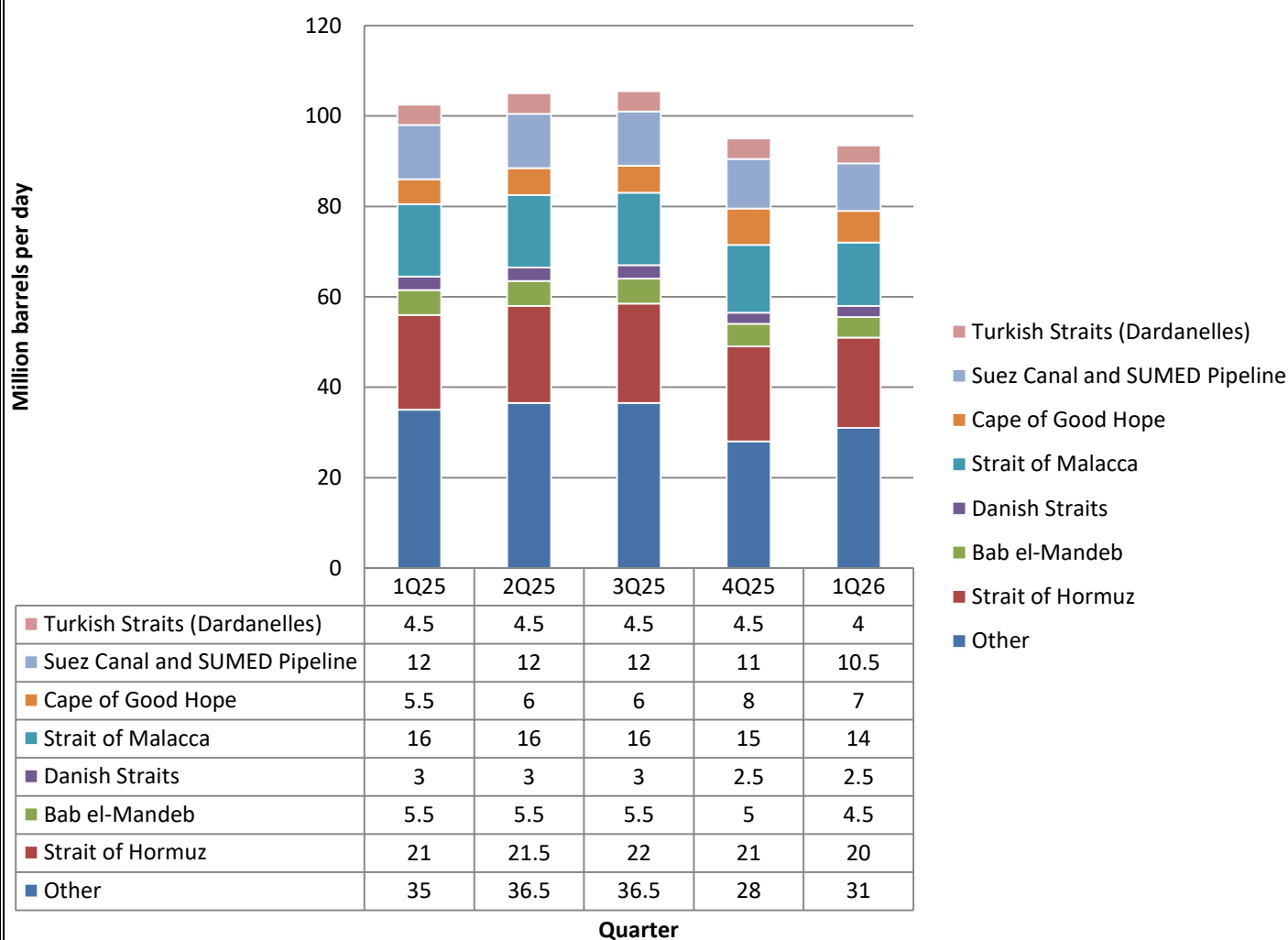
07/06/2026	5.4
08/06/2026	9
09/06/2026	7.4
10/06/2026	7.6
11/06/2026	7.4
12/06/2026	4.2
13/06/2026	3
14/06/2026	3.6
15/06/2026	18
16/06/2026	13.2
17/06/2026	16.8
18/06/2026	26.4
19/06/2026	22.8
20/06/2026	38.8
21/06/2026	24.6
22/06/2026	33
23/06/2026	33.8
24/06/2026	67.8
25/06/2026	57.4
26/06/2026	50
27/06/2026	37.6
28/06/2026	26.4
29/06/2026	35
30/06/2026	37.7

Figure 2: Transits through the Strait of Hormuz — June 2026

• Volume of Crude Oil & Petroleum Liquids Through World Chokepoints

Figure 3: Volume of Crude Oil & Petroleum Liquids Through World Chokepoints

Volume of Crude Oil & Petroleum Liquids Through World Chokepoints



• Strait of Hormuz — Key Statistics

Metric	Value (%)	Detail
Global petroleum liquids via Hormuz	20	~20 million barrels/day
Crude oil via Hormuz destined for Asia	84	China, Japan, South Korea, India
Europe LNG supply via Hormuz	13	12-14% range, primarily from Qatar
Global urea exports via Hormuz	32.5	30-35% range
Global ammonia exports via Hormuz	25	20-30% range

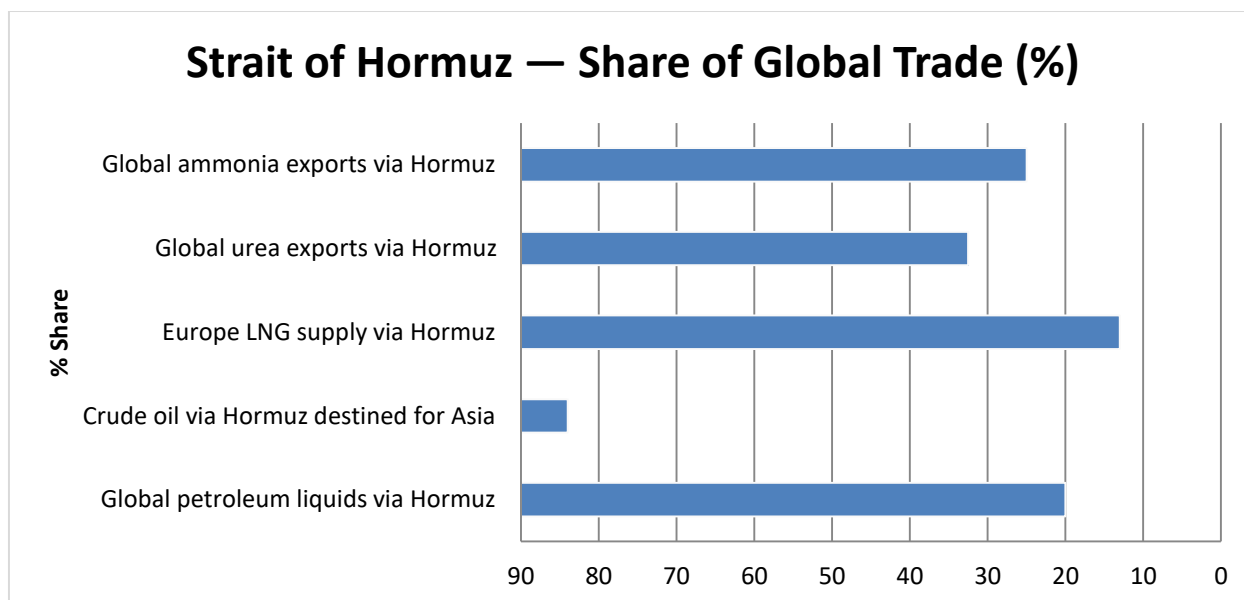


Figure 4: Strait of Hormuz — Share of Global Trade (%)

10. Calculations:

11. Equation calculation for future predictions:

Oil Prices (in dollars) for July 2000:

In graph, x-axis shows days from July 1 to July 31, and Y-axis will show Oil Prices (in dollars)
After manually drawing graphs and on excel.

We concluded that cubic equation covers maximum number of plots considering $y = ax^3 + bx^2 + cx + d$

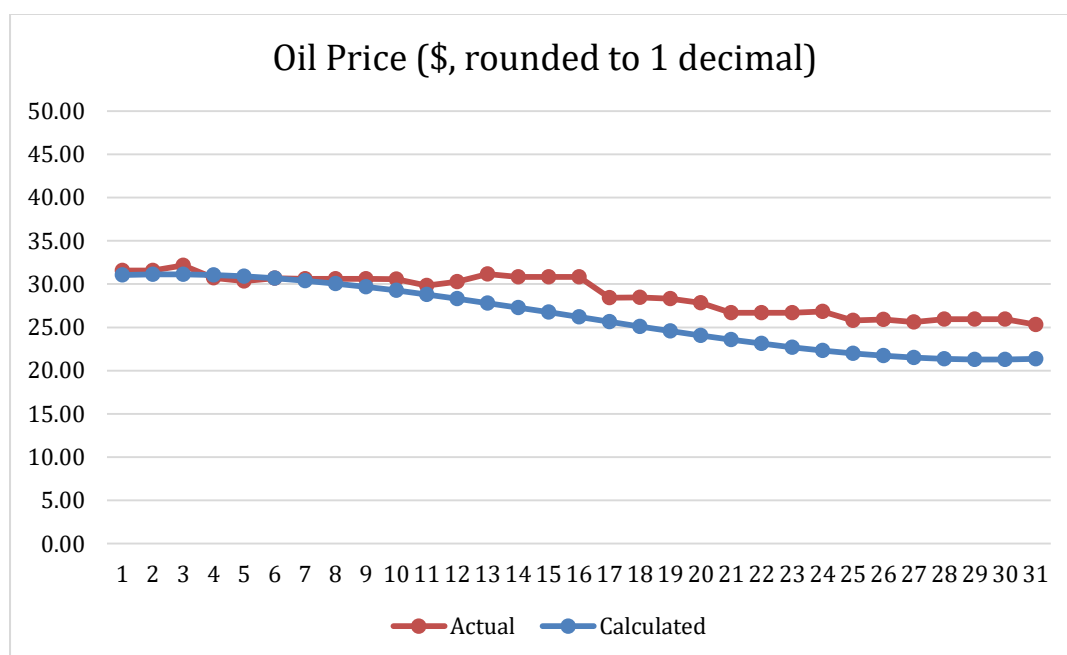


Figure 5: Actual and Calculated Oil Price (in dollars) for July 2000

Formula: $y = 0.001 * x^3 - 0.048 * x^2 + 0.22 * x + 30.868$

Where “y” represents Oil Price (\$, rounded to 1 decimal) and “x” represents July 1, 2000, to July 31, 2000

- ONGC Stock Price (in rupees) for July 2000:

In graph, x-axis shows days from July 1 to July 27, and Y-axis will show ONGC Stock Price (in rupees)

After manually drawing graphs and on excel.

We concluded cubic equation covers maximum number of plots considering $y = ax^3 + bx^2 + cx + d$

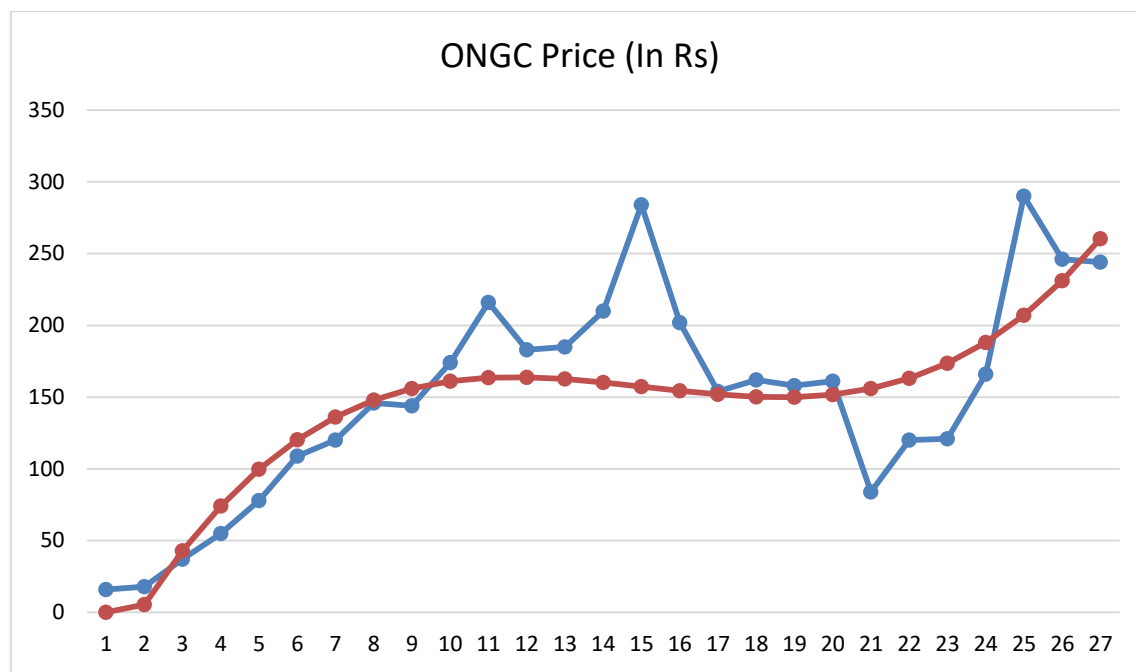


Figure 6: Actual and Calculated ONGC Stock Price (in rupees) for July 2000

Formula: $y = 0.084x^3 - 3.82x^2 + 54.87x - 89.65$

Where “y” represents ONGC Price (in rupees) and “x” represents July 1, 2000, to July 27, 2000

12. Hypothesis Test:

- Trade volume through Strait of Hormuz:

Reference point (14 July 2025): 583

Before War (6 months)

Month	Trade volume (1,000)
Aug 2025	374
Sep 2025	479
Oct 2025	415
Nov 2025	260
Dec 2025	243
Jan 2026	794

After War (6 months)

Month	Trade volume (1,000)
Feb 2026	327
Mar 2026	0
Apr 2026	90

May 2026	0
Jun 2026	0
Jul 2026	0

• IMF Port Waiting / Hormuz Trade — Hypothesis Test

Hypotheses

H0 : $\mu_1 = \mu_2$

H1 : $\mu_1 > \mu_2$

μ_1 = Mean trade volume through Strait of Hormuz for 6 months before war (Aug 2025 – Jan 2026)

μ_2 = Mean trade volume for 6 months after start of war (Feb 2026 – Jul 2026)

Significance level = 5% ($\alpha = 0.05$)

confidence interval = 95%

Welch t-test

Statistic	Value
t	3.653
p-value	2.86×10^{-3}
df	8.6
$\bar{x}_1$ (mean, before)	427.5
$\bar{x}_2$ (mean, after)	69.5
Sx1 (std dev, before)	201.04
Sx2 (std dev, after)	131.18
n1	6
n2	6

Decision: $p (0.0029) < \alpha (0.05) \rightarrow$ Reject Null Hypothesis

Conclusion: There is statistically significant evidence at the 5% level that mean trade through the Strait of Hormuz was lower in the six-month post-event period than in the six-month pre-event period.

• Quarterly / Weekly Data — Brent Oil Price, Pre / Post War:

Sr No.	Month (Before)	Price	Month (After)	Price
1	Oct	65	Mar	98
2	Oct	63	Mar	105
3	Oct	61	Mar	115
4	Oct	66	Mar	116
5	Nov	65	Apr	109
6	Nov	64	Apr	100
7	Nov	64	Apr	96
8	Nov	62	Apr	106
9	Dec	63	May	107
10	Dec	64	May	104
11	Dec	61	May	110
12	Dec	61	May	101
13	Jan	61	Jun	92
14	Jan	63	Jun	96
15	Jan	64	Jun	85

16	Jan	68	Jun	82
17	Feb	68	Jul	73
18	Feb	68	Jul	72
19	Feb	68	Jul	76
20	Feb	71	Jul	(74) projected

Note: Last value for July (post-war) is marked as projected/estimated in the original notes.

• **Brent Oil Price — Welch's t-test (20 Observations Before and After):**

20 observations before and 20 after, so.

	before	after
n	20	20
mean	64.50	95.85
standard deviation	2.87	14.25

$H_0: \mu_1 \geq \mu_2$

$H_1: \mu_1 < \mu_2$

μ_1 = Mean Brent crude oil price before the event; μ_2 = Mean Brent crude oil price after the event.

Welch's t-test as variance different, calculating $t = (64.50 - 95.85) / \sqrt{[(2.87^2/20) + (14.25^2/20)]} = -9.64$

$df = 20.54$ and one-tailed p value = 2.25×10^{-9} , thus result:

t	-9.64
df	20.54
p value	2.25×10^{-9}
α	0.05

$p < 0.05$, therefore H_0 is rejected.

Mean Brent crude oil price increased from \$64.50 before war to \$95.85 after and the difference is statistically significant by Welch's t-test, and thus results support H_1 , showing a statistically significant increase in Brent crude oil prices after the event.

11. Conclusion & Synthesis

In conclusion, a closure of the Strait of Hormuz and the resulting spike in Brent crude to \$112.57/bbl represents a severe external supply shock to the Indian economy. The transmission channels are rapid and structural, placing pressure on the current account, domestic inflation, and public finances.

However, India's modern macroeconomic framework supported by substantial foreign exchange reserves, proactive monetary targeting, and growing domestic energy alternatives provides better structural resilience than during past energy crises. Implementing targeted policy frameworks, such as expanding Strategic Petroleum Reserves and diversifying trade settlement mechanics, will be critical to insulating India's growth path from geopolitical risks in global energy chokepoints.

Exhibits & Data Visualizations

Exhibit 1: Brent Crude Price Jump Simulation

This chart illustrates the immediate 55.3% surge in Brent crude prices from the baseline \$72.00/bbl to \$112.57/bbl under the complete Strait of Hormuz blockade scenario.

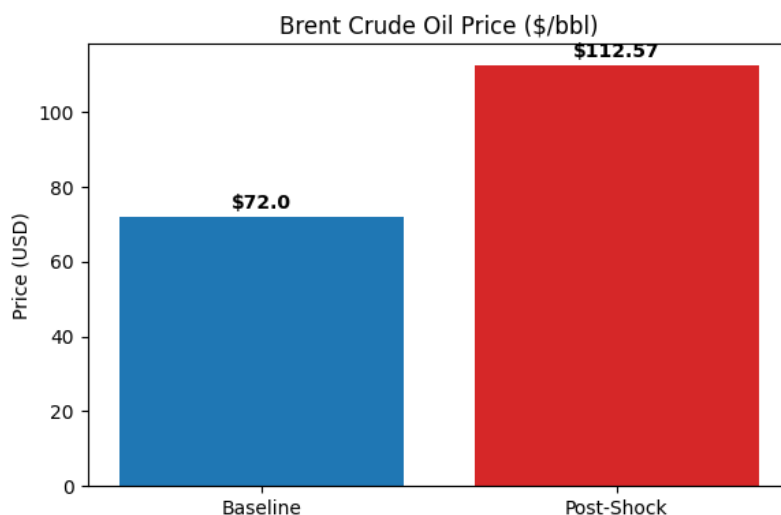


Figure 7: Baseline vs post-shock price of Brent crude oil per barrel (in dollars)

Exhibit 2: Structural Energy Import Dependency

Demonstrating India's reliance on external energy sources, importing over 85% of crude oil and 50% of natural gas requirements.

Figure 8: Percentage of India's energy dependency on crude and natural gas

Exhibit 3: Macroeconomic Impact - Current Account Deficit Expansion

Shows the linear relationship between rising oil prices and the widening of India's Current Account Deficit as a percentage of GDP.

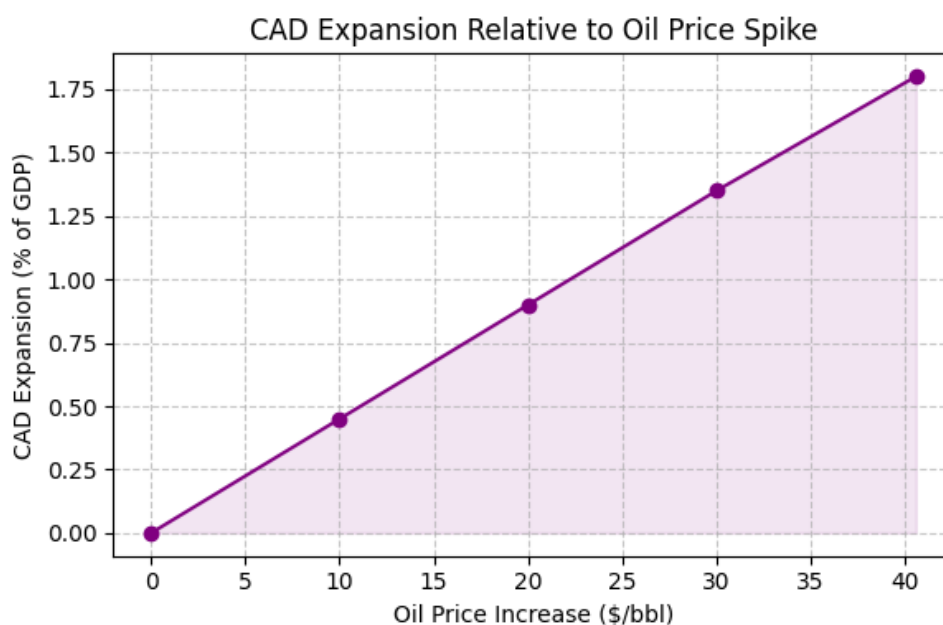


Figure 9: Rising oil prices and the widening of India's Current Account Deficit as a percentage of GDP

Exhibit 4: Inflationary Pass-Through Dynamics

Highlights the two-tier transmission of oil price shocks into Wholesale Price Index (WPI) and Consumer Price Index (CPI) inflation.

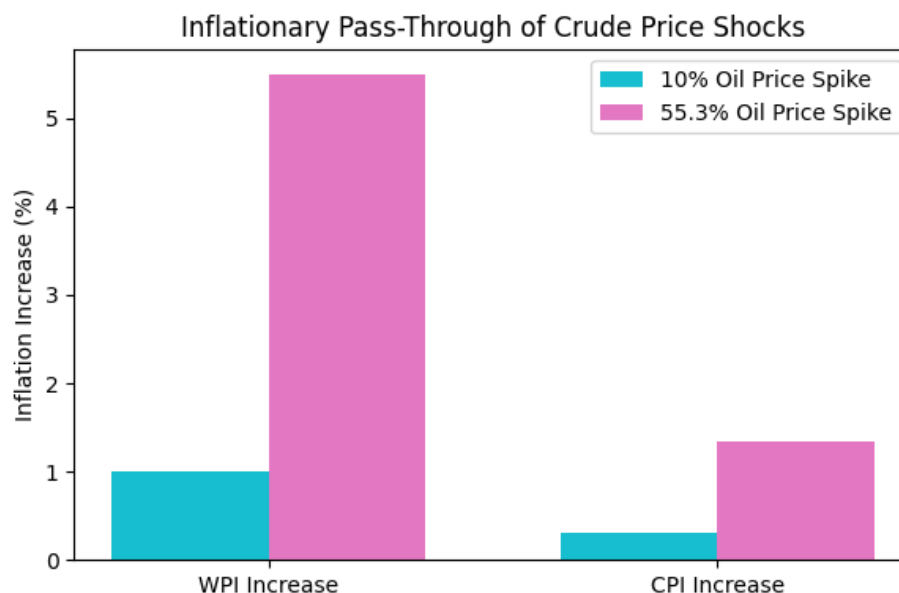


Figure 10: Inflation pass-through of crude oil price shock

Exhibit 5: Microeconomic Impact - Sectoral Cost Pressures

Illustrates the severe margin compression faced by industries heavily reliant on petroleum derivatives, such as aviation and paints.

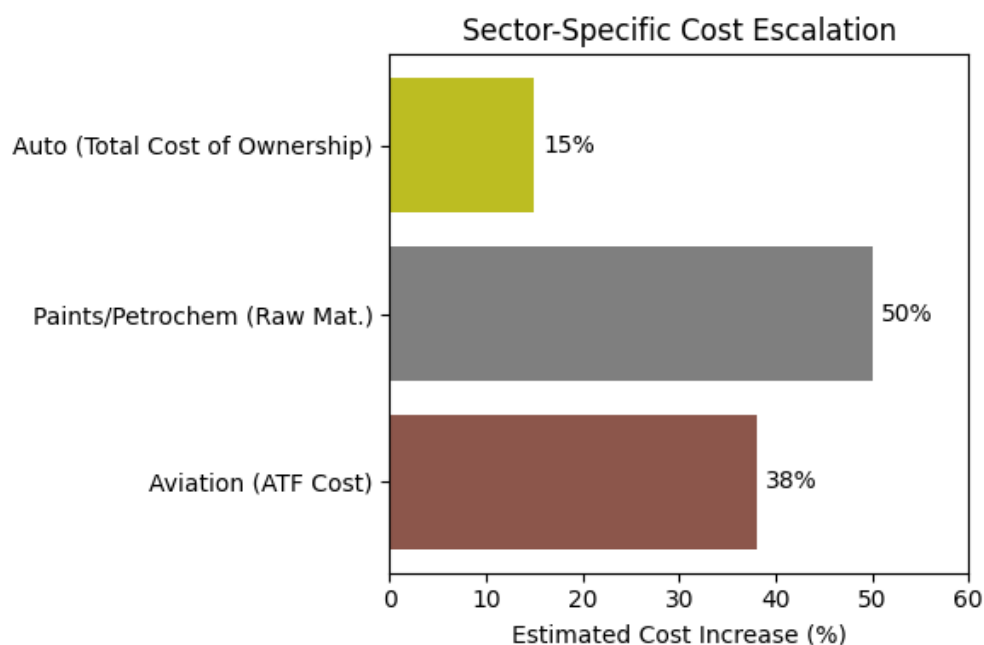


Figure 11: Sector-wise cost escalation

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- *Active Economics tutor and mentor within the r/IGCSE community.*
- *He is invited by John Locke institute to London for the prize ceremony*

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