Palau Technical Note

The Historical Impact of Global Oil Price Movements on Domestic Gasoline Prices in the North Pacific

EconMAP

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1. Summary

This technical note finds that the pass-through from global oil prices to domestic gasoline prices has historically been larger in Palau than in the Federated States of Micronesia (FSM) and the Republic of the Marshall Islands (RMI). Pass-through occurs almost immediately in Palau and RMI, but with a one-quarter lag in FSM. In Palau, the impact typically persists for around one quarter following the initial global price shock, whereas in FSM effects continue to feed through for up to two quarters afterwards. The evidence for RMI is more mixed, with results suggesting a response in domestic gasoline prices that lingers for an additional one to two quarters after the initial shock. (See **Table 1 below**.)

This Technical Note:

- Estimates the historical pass-through from global oil prices to domestic gasoline prices in Palau, RMI, and FSM;
- Finds that pass-through has historically been strongest in Palau, with a 10%-pt increase in global oil price inflation raising domestic transport fuel inflation by around 3.9%-pts;
- Shows that pass-through is partial rather than one-for-one, reflecting the role of margins, taxes, shipping costs, and other components of domestic pump prices;
- Identifies important differences in the timing of pass-through across the North Pacific, with adjustment occurring most quickly in Palau and more gradually in RMI and FSM;
- Uses distributed lag and VAR analysis to assess the size, timing, and persistence of domestic fuel price responses to global oil price shocks;
- Models alternative global oil price scenarios to estimate the likely path of domestic gasoline price inflation through 2026 and early 2027.

This Technical Note has been prepared by the Graduate School USA's (GSUSA) Economic Monitoring and Analysis Program (EconMAP), with funding support from the Asian Development Bank and the U.S. Department of the Interior. A digital copy of this note, and additional information on the EconMAP program, is available online at ***https://econmap.org***.

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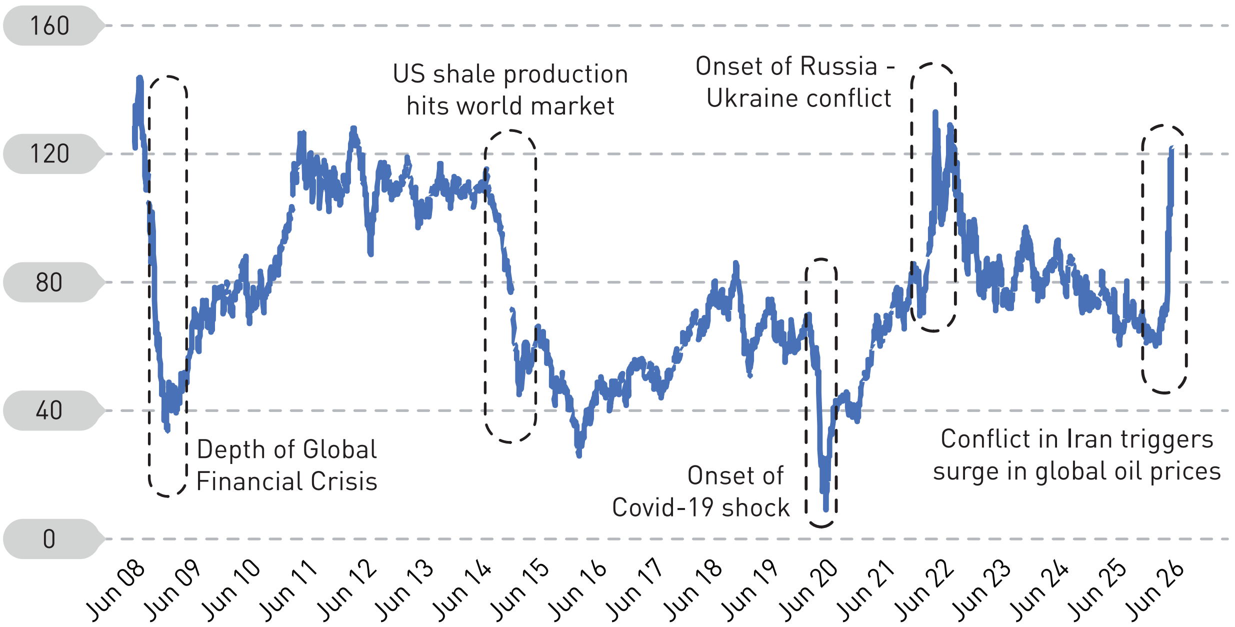
Table 1: Summary of Key Findings

Country	Initial Response	Persistence	Total Pass-Through (10%-pt Change in Global Prices)
Palau	Immediate	1 Quarter After Initial Shock	3.9%-pt
RMI	Immediate	1 to 2 Quarters After Initial Shock (Mixed Evidence)	2.7%-pt
FSM	1-Quarter Lag	2 Quarters After Initial Shock	2.6%-pt

2. Introduction

The ongoing conflict in Iran has triggered a surge in global oil prices, raising concerns about domestic fuel inflation. Over the course of March 2026, the price of Brent crude oil leapt from USD 76.36 to USD 115.35 per barrel (pb) [1] – a 51.1% increase (see **Chart 1**). As this rise has been driven by geopolitical tensions, the outlook for global oil markets remains highly uncertain, warranting a scenario-based approach to capture the range of possible oil price paths and their implications for domestic fuel prices.

Chart 1: Brent Crude Oil Price (USD Per Barrel)



Source: US Energy Information Administration (EIA) via Federal Reserve Economic Data (FRED) Database

1 Brent crude oil prices are based on the US Energy Information Administration (EIA) spot price series (FRED: DCOILBRENTEU), reflecting physical crude transactions rather than futures prices. This ensures alignment with observed fuel prices and refining margins in pass-through analysis. As a result, these prices may be higher than those reported in the media, particularly during periods of supply disruption when physical crude trades at a premium to futures benchmarks.

Against this backdrop, this technical note analyses the historical relationship between global oil prices and domestic fuel prices in Palau, RMI, and FSM, and uses this to inform scenario-based projections under alternative oil price trajectories. In this note, “domestic fuel prices” refer to the retail price of automotive gasoline purchased at the pump by households, as captured in the transport fuel component of CPI. We use the same measure for all three economies.

Relationship Between Global Oil Prices and Domestic Pump Prices – Levels

Domestic fuel prices in the North Pacific have historically been two to four times higher than global crude prices. This is demonstrated in panels (a), (b) and (c) of **Chart 2**, which show that domestic fuel prices broadly track movements in global oil prices, while remaining elevated relative to global crude benchmarks.

Relationship Between Global Oil Prices and Domestic Fuel Prices – Inflation Rates: Graphical Approach

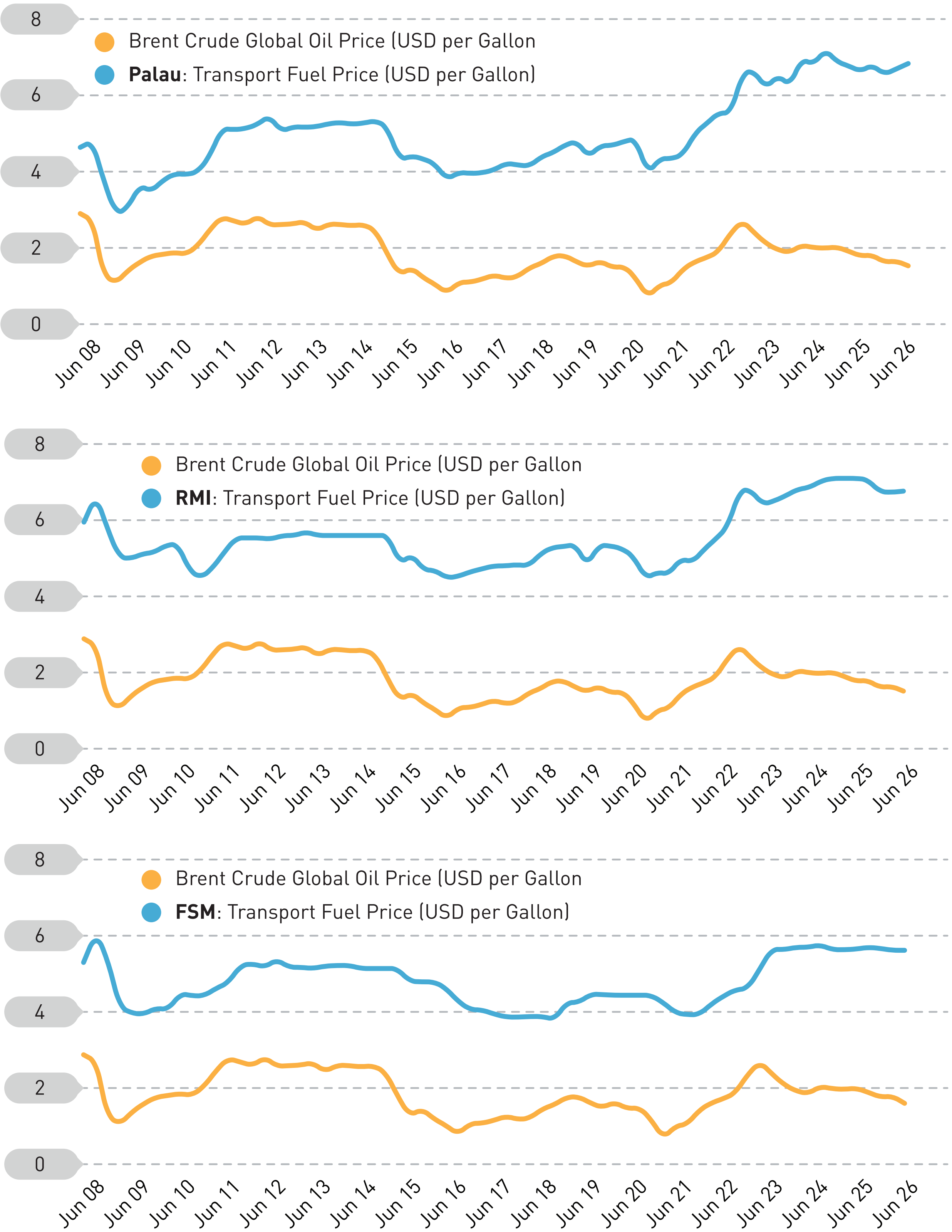
Across all three countries, there is a strong relationship between global oil price inflation and domestic pump price inflation. Panels (a), (b) and (c) of **Chart 3** compare year-on-year changes in the Brent crude price with changes in the transport fuel component of CPI. In each case, the two series move closely together, indicating a high degree of pass-through from global to domestic fuel prices.

An important difference across countries is the speed at which changes in global oil prices feed through into domestic prices. Pass-through appears to be most immediate in Palau, where domestic prices move broadly in line with global oil prices. Based on the graphical analysis, domestic prices appear to respond with a lag of one quarter in RMI, while in FSM the adjustment is slower, with a lag of approximately two quarters.

It is important to understand that pass-through from global oil prices to domestic fuel prices is less than one-for-one. In practice, even large changes in global prices translate into smaller changes at the pump. Only a portion of the final price is directly tied to global oil prices, while the remainder consists of margins, taxes and other components that do not adjust proportionally. This is illustrated in all of the panels in Chart 3, where global oil price inflation (left-hand axis) is plotted alongside domestic fuel inflation (right-hand axis). The more compressed scale on the right-hand axis highlights the more muted response of domestic fuel inflation.[2]

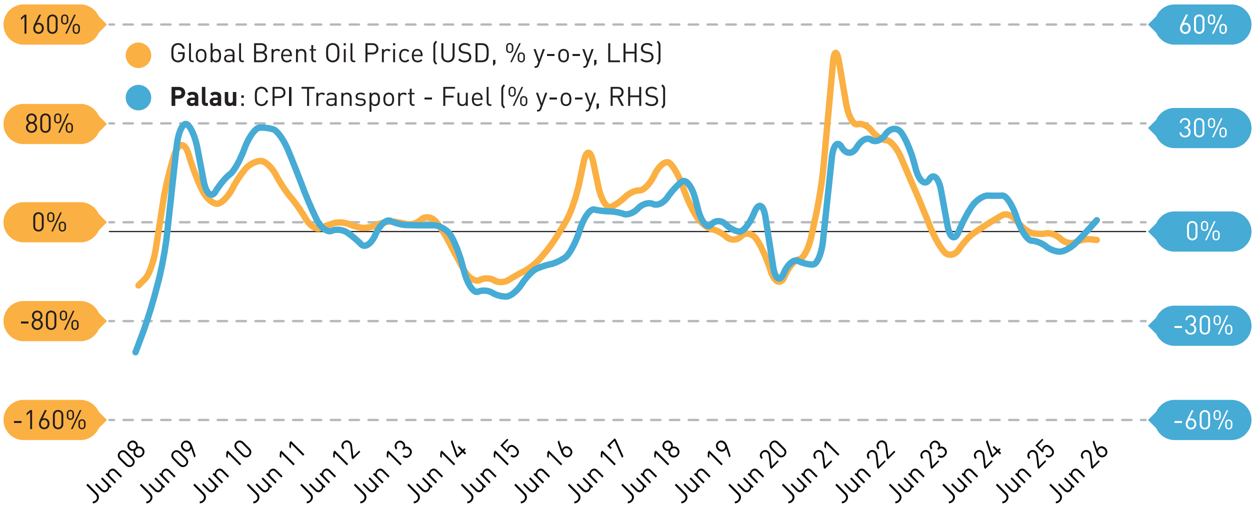
2 While Chart 3 provides a useful visual indication of the timing of pass-through, the precise lag structure is clarified through the regression analysis. In particular, although RMI appears to respond with a slight delay in the graphical analysis above, the econometric results indicate that a portion of the adjustment occurs contemporaneously, with additional effects materialising over subsequent quarters. In FSM, by contrast, there is little evidence of an immediate response, with pass-through occurring a lag of one or two quarters.

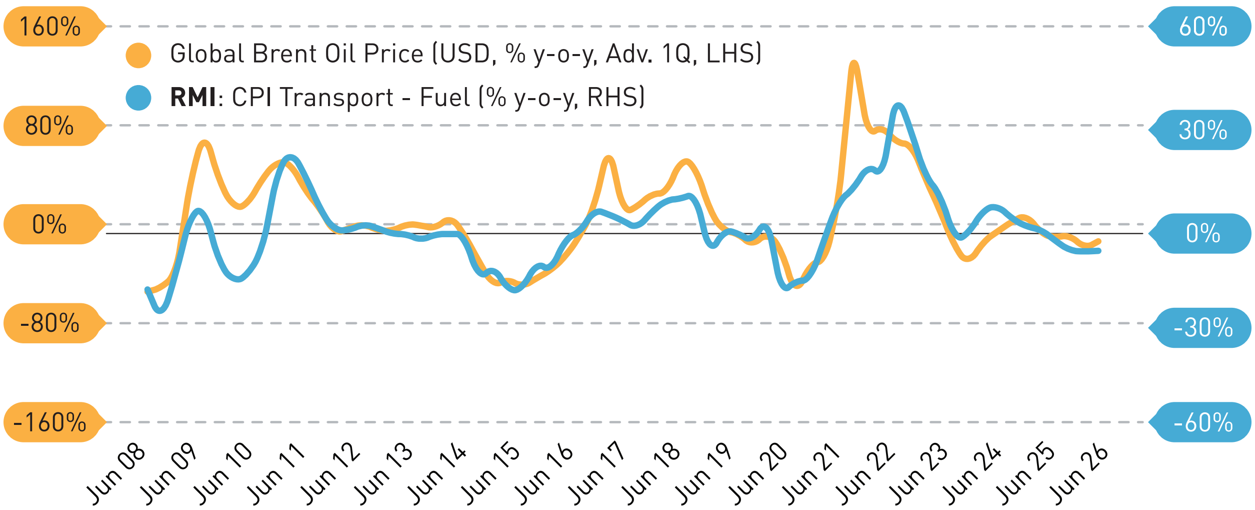
Chart 2: Global Oil Prices and Domestic Fuel Prices (USD Terms)

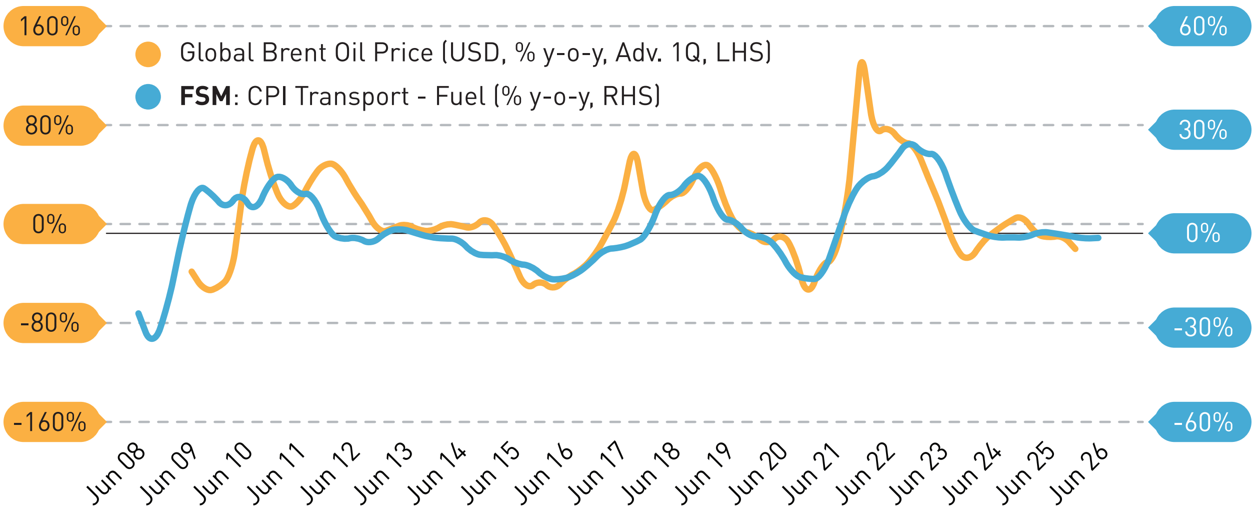


Sources: Federal Reserve Economic Data (FRED) Database, RMI EPPSO, FSM Division of Statistics, and Palau Ministry of Finance.

Chart 3: Global Oil Prices and Domestic Fuel Prices (% y-o-y)







Sources: Federal Reserve Economic Data (FRED) Database, RMI EPPSO, FSM Division of Statistics, and Palau Ministry of Finance.

Relationship Between Global Oil Prices and Domestic Fuel Prices – Inflation Rates: Technical Approach

Regression analysis also indicates that pass-through from global oil prices in strongest in Palau. To quantify this relationship, we estimate how changes in global oil prices feed into domestic fuel inflation, allowing us to summarise the degree and timing of pass-through. Specifically, we estimate a distributed lag model over the period Q2 2009 to Q4 2025 of the form:

$$\boldsymbol{\pi_t^F = \beta_0 + \beta_1\pi_t^G + \beta_2\pi_{t-1}^G + \beta_3\pi_{t-2}^G + \varepsilon_t}$$

where:

π_t^F = *domestic fuel inflation (year-on-year change in fuel for transport) at time t*

π_t^G = *global oil price inflation (year-on-year change in Brent crude oil index) at time t*

β_0 = *constant term*

β_1 = *contemporaneous pass-through of global oil price inflation to domestic fuel inflation*

β_2 = *pass-through of global oil price inflation with a one-quarter lag*

β_3 = *pass-through of global oil price inflation with a two-quarter lag*[1]

$\boldsymbol{\varepsilon_t}$ = *error term*

Using this regression equation, we estimate the β_1, β_2 and β_3 coefficients, which capture the extent of pass-through from global oil prices to domestic fuel inflation and the time it takes for the pass-through to occur across the three economies. These three coefficients are highlighted in **Table 2** below for all three countries. (Note that the full regression outputs for each country are outlined in **Annex 1**.)

Table 2: Pass-Through Coefficients by Country

Coefficient	Palau	RMI	FSM
β_1 (inflation impact – immediate)	0.175***	0.076**	-0.036
β_2 (inflation impact after 3 months)	0.157***	0.108**	0.116***
β_3 (inflation impact after 6 months)	0.060	0.089**	0.176***
SUM	0.391***	0.273***	0.256***

Source: Author estimates based on data from FRED Database, RMI EPPSO, FSM Division of Statistics, and Palau Ministry of Finance.
Notes: *** $p<0.01$, ** $p<0.05$, * $p<0.10$

3 We use a two-lag distributed lag model to capture how changes in global oil prices feed through to domestic fuel prices over time. The data show that most of the adjustment occurs within two quarters, with little additional effect beyond this period. This is consistent with the patterns which are observed in Chart 3 and is supported by the VAR analysis below, which shows that the impact of oil price shocks is concentrated in the first few quarters. Adding more lags does not materially change results, so the two-lag specification provides a reliable way to capture the timing and size of pass-through.

The estimates outlined in Table 1 imply that a 10 percentage point (%-pt) increase in global oil price inflation (in year-on-year terms) has historically raised the year-on-year rate of domestic transport fuel inflation by 3.9%-pt in Palau, 2.7%-pt in RMI and 2.6%-pt in FSM. These results confirm partial pass-through, with Palau exhibiting the strongest responsiveness. The effects are cumulative and materialise over a period of up to two quarters, reflecting the distributed lag structure of the model.

These results confirm that the amount of time that it takes for a change in global oil prices to affect domestic fuel inflation varies across the North Pacific. In Palau, pass-through is both immediate and persists into the following quarter, with statistically significant effects in the contemporaneous period and at a one-quarter lag. In contrast, pass-through in RMI is more prolonged, with statistically significant effects observed contemporaneously and up to two quarters after the initial shock. There is no evidence of an immediate response in domestic fuel prices in FSM, where pass-through occurs with a delay – statistically significant effects only emerge after one and two quarters.

Differences in the timing of pass-through across countries are likely to be the result of a combination of both structural and institutional factors. In Palau, the relatively immediate response of domestic fuel prices is consistent with a more flexible pricing environment, allowing global price changes to be passed through quickly. In contrast, the more delayed adjustment in FSM may reflect the role of state-owned fuel distribution[4] and price smoothing, which can slow the transmission of global price shocks to retail prices. Geographic factors may also play a role: FSM's more dispersed island geography and potentially less frequent shipping schedules may contribute to longer adjustment lags. RMI lies between these cases, with pass-through occurring over a slightly longer horizon than in Palau but more quickly than in FSM. While these explanations are indicative, they are consistent with the empirical patterns observed in the data.

Vector Autoregression Analysis of Oil Price Pass-Through

These findings are broadly reinforced by additional analysis using a vector autoregression (VAR) framework. While the distributed lag model provides a direct estimate of pass-through coefficients, the VAR approach allows us to trace the full dynamic response of domestic fuel inflation to a global oil price shock over time without imposing a fixed lag structure. It provides a complementary perspective on the persistence of shocks and the speed at which inflation returns to baseline across countries, capturing both the magnitude and persistence of pass-through in a more flexible framework compared to the distributed lag model.

Specifically, we estimate the relationship between global oil price inflation and domestic fuel inflation using quarterly quarter-on-quarter inflation rates of the form:

4 In FSM, fuel storage and distribution is managed by the state-owned FSM Petroleum Corporation (FSMPC). The country adopts a pricing policy framework model implemented by the FSMPC. ***Government Monitors International Fuel Prices and Supply Conditions – FSM Government***

$$\boldsymbol{\pi_t^F} = \boldsymbol{\alpha} + \sum_{i=\mathbf{1}}^{p} \boldsymbol{\beta}_i \boldsymbol{\pi_{t-i}^G} + \sum_{i=\mathbf{1}}^{p} \boldsymbol{\gamma}_i \boldsymbol{\pi_{t-i}^F} + \boldsymbol{\varepsilon_t}$$

where:

π_t^F = *domestic fuel inflation (quarter-on-quarter change in transport fuel CPI) at time* t

π_t^G = *global oil price inflation (quarter-on-quarter change in Brent crude prices) at time* t

$\boldsymbol{\alpha}$ = *constant term*

β_i = *effect of global oil price inflation at lag* i

γ_i = *effect of past domestic fuel inflation at lag* i

p = *number of lags included in the VAR*

$\boldsymbol{\varepsilon}_t$ = *error term*

Using a VAR analysis, we observe that the impact of an oil price shock on fuel inflation persists for two quarters in Palau and RMI, and for up to three quarters in FSM. A key methodological difference in the VAR framework is that we analyse quarter-on-quarter (rather than year-on-year) changes in prices, allowing us to better capture short-term dynamics.

Simulating a 50% quarter-on-quarter increase in global oil prices – in line with the increase in global prices experienced in the first quarter of 2026 – the VAR results suggest a cumulative increase in fuel inflation of just under 20 percentage points in FSM and RMI, and approximately 30 percentage points in Palau over the respective adjustment periods. (These results are shown graphically in **Chart 4**.)

Future Path of Fuel Inflation in the North Pacific

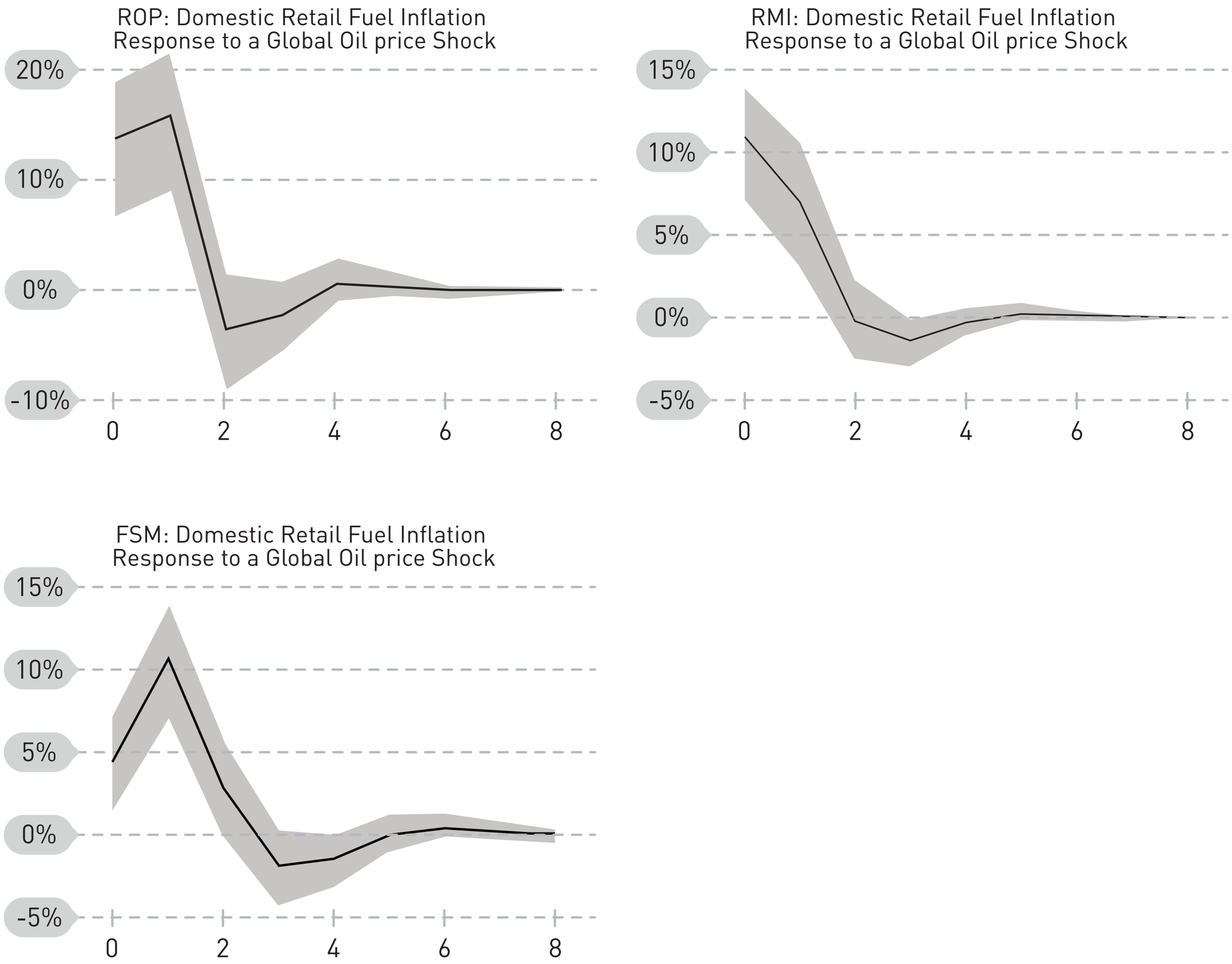
Using the estimates from the lagged distributional model, we consider how different global oil price scenarios would feed through into domestic fuel inflation. In doing so, we account for the differences in timing observed above. We model eight different oil price scenarios, in which the price is set at various levels ranging from USD 60 to USD 200 pb.

We assume that, in each scenario, the oil price remains at the specified level for the upcoming 12-month period between April 2026 and March 2027. In reality, oil prices are likely to evolve unevenly over the projection horizon, rather than remaining fixed at a given level, and it is unlikely that prices would adjust immediately to a specified level at the start of April 2026. Nonetheless, this approach is a useful way to evaluate the potential range and timing of domestic fuel price responses under alternative global oil price scenarios.

The largest and most immediate impact of higher global oil prices on domestic fuel inflation would be in Palau. Panel (a) of **Chart 5** shows that, from Q2 2026 onwards (dashed red line), fuel inflation in Palau would rise sharply under every scenario in which the global oil price is projected to remain above USD 80pb.

If we assume that oil prices remain at their current level of around USD 100pb, Palau fuel inflation would rise to around 20% y-o-y in the second half of 2026, peaking in Q4 before easing slightly at the start of 2027. Under more extreme scenarios, the impact becomes substantially larger. If oil prices were to reach and remain at USD 200pb, fuel inflation in Palau is projected to climb to around 80% y-o-y by the end of 2026.

Chart 4: VAR Analysis – Modelling a One Period 50% Quarter-on-Quarter Rise in Global Oil Prices on Q-o-Q Rate of Domestic Fuel Inflation)

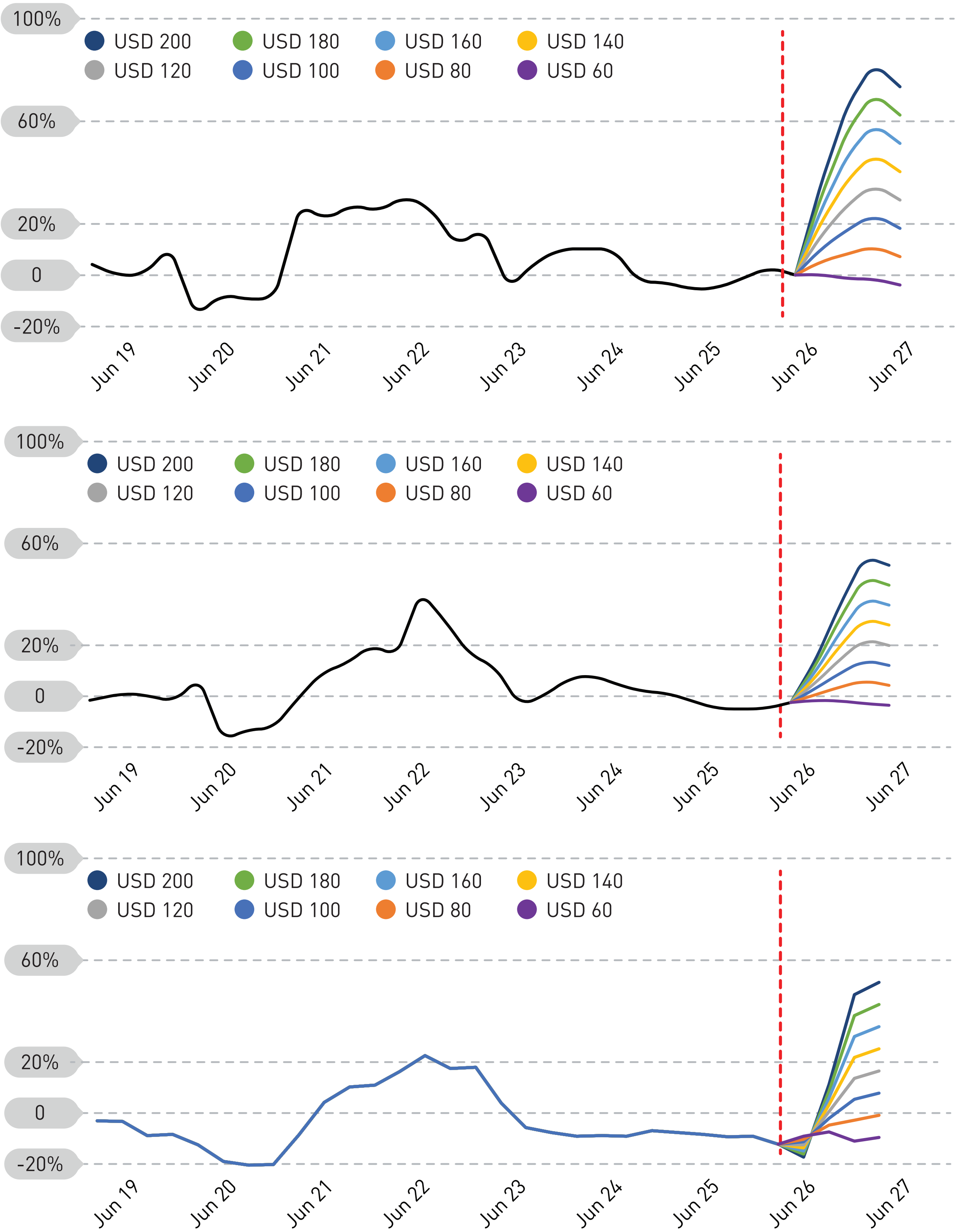


Sources: Authors Calculations using data from FRED Database, RMI EPPSO, FSM Division of Statistics, and Palau Ministry of Finance.

The impact in RMI and FSM is likely to be delayed and more muted, reflecting delays in pass-through. In RMI, the sharpest acceleration in fuel inflation is likely to occur in Q3 2026. Under a moderate oil price scenario of USD 100pb, fuel inflation is projected to climb to 13-14% y-o-y in the final quarter of 2026, before peaking in early-2027. In the most pernicious scenario of USD 200pb, fuel inflation is projected to rise to just over 50% y-o-y.

In FSM, where pass-through appears to occur with a two-quarter lag, the response is further delayed and more gradual. Fuel inflation only begins to rise meaningfully in late-2026, with peaks occurring in early-2027. Similarly to RMI, under a USD 100pb scenario, fuel inflation in FSM is assumed to climb to 15% y-o-y, peaking in the first quarter of 2027. In the most extreme case (USD 200pb), fuel inflation is projected to hit close to 50% y-o-y in FSM.

Chart 5: Global Oil Prices and Domestic Fuel Prices (% y-o-y)

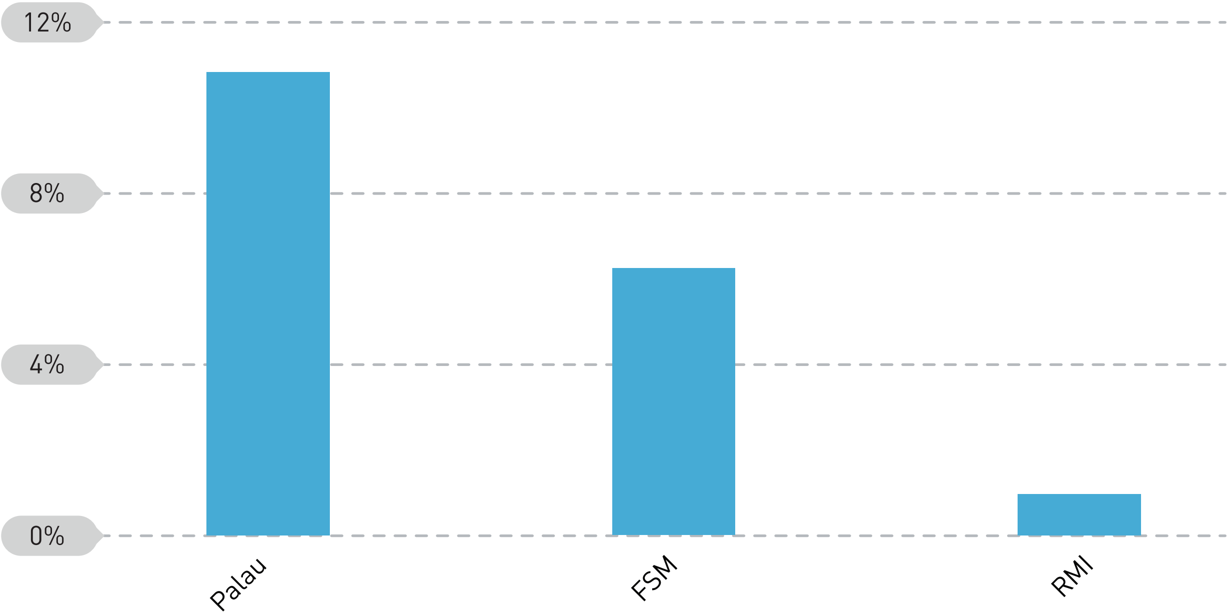


Sources: Federal Reserve Economic Data (FRED) Database, RMI EPPSO, FSM Division of Statistics, and Palau Ministry of Finance.
Note: It is assumed that oil prices remain at the modelled levels between Q2 2026 and Q1 2027

Share of Fuel in Consumer Price Baskets

The impact of rising transport fuel inflation on headline inflation depends on the weight of transport fuel in the CPI basket – this differs markedly across countries. As shown in **Chart 6**, transport fuel accounts for a far larger share of the CPI basket in Palau (10.8%) compared to FSM (6.2%) and RMI (1.0%).

Chart 6: Transport Fuel (% of CPI Basket)



Sources: RMI EPPSO, FSM Division of Statistics, and Palau Ministry of Finance.
Note: RMI figure refers to this CPI basket share in Majuro only.

Using these weights and the projected paths of fuel inflation can help to provide a sense of the potential inflationary impact of an oil price shock. Based on fuel's 10.8% weight in Palau's CPI basket and the projected increase in fuel inflation to just over 20% y-o-y in the second half of 2026 (from 3% in Q4 2025) if Brent crude prices remain at USD 100pb, a reasonable estimate is that this channel alone could add approximately 2%-pts to headline inflation over the course of 2026. Using the vector autoregression (VAR) framework discussed earlier in this note, we estimate that a one-off 50% oil price shock – similar in magnitude to that experienced in Q1 2026 – would add a cumulative 1.6%-pts to the q-o-q rate of headline inflation in Palau. (See **Annex 2** for more details.)

However, higher oil prices also feed through into other components of the CPI basket, particularly via transport, utility and distribution costs. As a result, the overall impact on headline inflation is likely to exceed the direct contribution implied by fuel's weight in the CPI basket. This is the case in RMI, where the use of private hire transport is more prevalent than in other parts of the North Pacific. As such, any projections presented here must be interpreted as a lower bound of the total inflationary impact of global oil price shocks.

Relationship Between Crude and Refined Oil Prices

One note of caution is that this analysis relies on Brent crude oil prices – rather than refined prices. While Brent serves as a useful and easily-accessible proxy for global oil price movements, domestic fuel prices in the North Pacific are more directly linked to refined product benchmarks, particularly Singapore Mogas 92. **Chart 7** plots the price of Brent crude against that of Mogas, showing that Mogas has consistently traded at a premium to Brent. This reflects refining margins, transport costs, and distribution mark-ups.

Moreover, the ratio of Mogas to Brent widened at the onset of the Iran conflict, indicating an increase in downstream margins alongside the increase in crude prices. This suggests that recent fuel price pressures have been amplified beyond what is captured by crude oil movements alone.

However, the latest increase in the Mogas-Brent price differential is smaller than observed during the most recent previous global oil price shock, caused by the onset of Russia–Ukraine conflict in 2022. (See **Chart 8**.) At that time, reduced global refining capacity, coupled with a sharp rebound in demand as the global economy began to recover from the Covid-19 pandemic, drove a more pronounced increase in this spread. By contrast, the recent widening of the Mogas-Brent price gap appears to largely reflect elevated transport costs and risk premia linked to disruptions in the Strait of Hormuz – rather than an acute shortage of refining capacity. (A deeper breakdown of the full cumulative mark-up between global crude oil prices and the final gasoline retail price for Palau is presented in **Annex 3**.)

This helps reconcile the tension between recent market narratives and observed price dynamics. While disruptions to Middle Eastern supply routes have increased the cost of delivering refined products to end markets, this has not translated into a larger increase in gasoline margins than in 2022. The implication is that while the estimates presented in this analysis may still represent a lower bound of the pass-through from global oil prices to domestic fuel inflation under current conditions, the extent of this underestimation is likely to be more modest than during previous episodes of extreme refining margin expansion.

Indeed, it is important to note that after an initial surge, when the Mogas-Brent price ratio hit 1.29 in March 2026, it has since fallen back closer towards its long-run average. This is probably a reflection of elevated risk premia and precautionary pricing in refined fuel markets beginning to ease, meaning that the initial spike may have overstated the underlying tightening in physical supply conditions. Accordingly, Brent crude oil prices remain an appropriate and robust basis for pass-through analysis as they capture underlying cost dynamics, while refined product margins introduce temporary deviations around this trend.

Concluding Remarks

Overall, the analysis highlights a strong pass-through from global oil prices to domestic fuel inflation, with differences in timing and magnitude across countries. The results provide a clear indication of the potential scale and timing of direct fuel price pressures under alternative scenarios. While broader inflationary effects may arise through indirect channels, these are not explicitly modelled. The analysis incorporated in this technical note should be interpreted as capturing the first-round impacts on fuel prices.

Chart 7: Global Crude and Refined Oil Prices (USD Per Barrel)

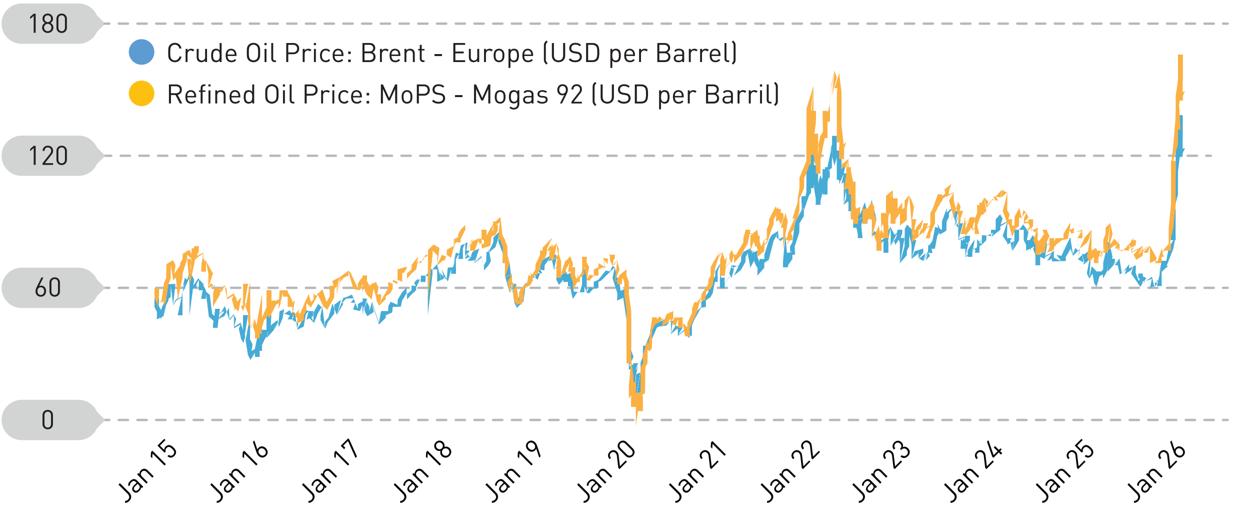
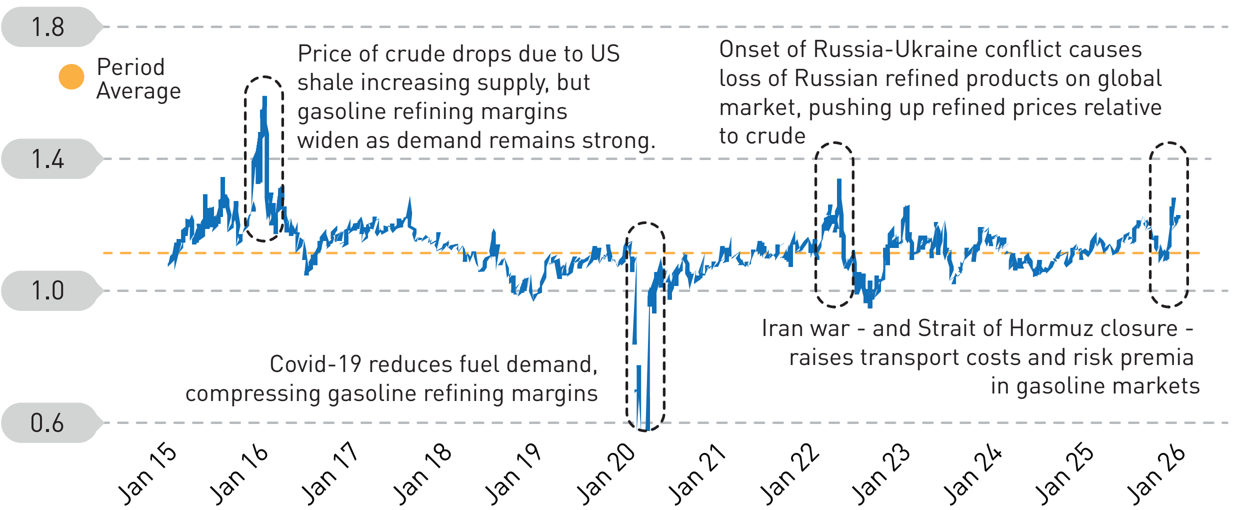


Chart 8: Ratio of Refined Oil Prices (MoPS – Mogas 92) to Crude Oil Price (Brent – Europe)



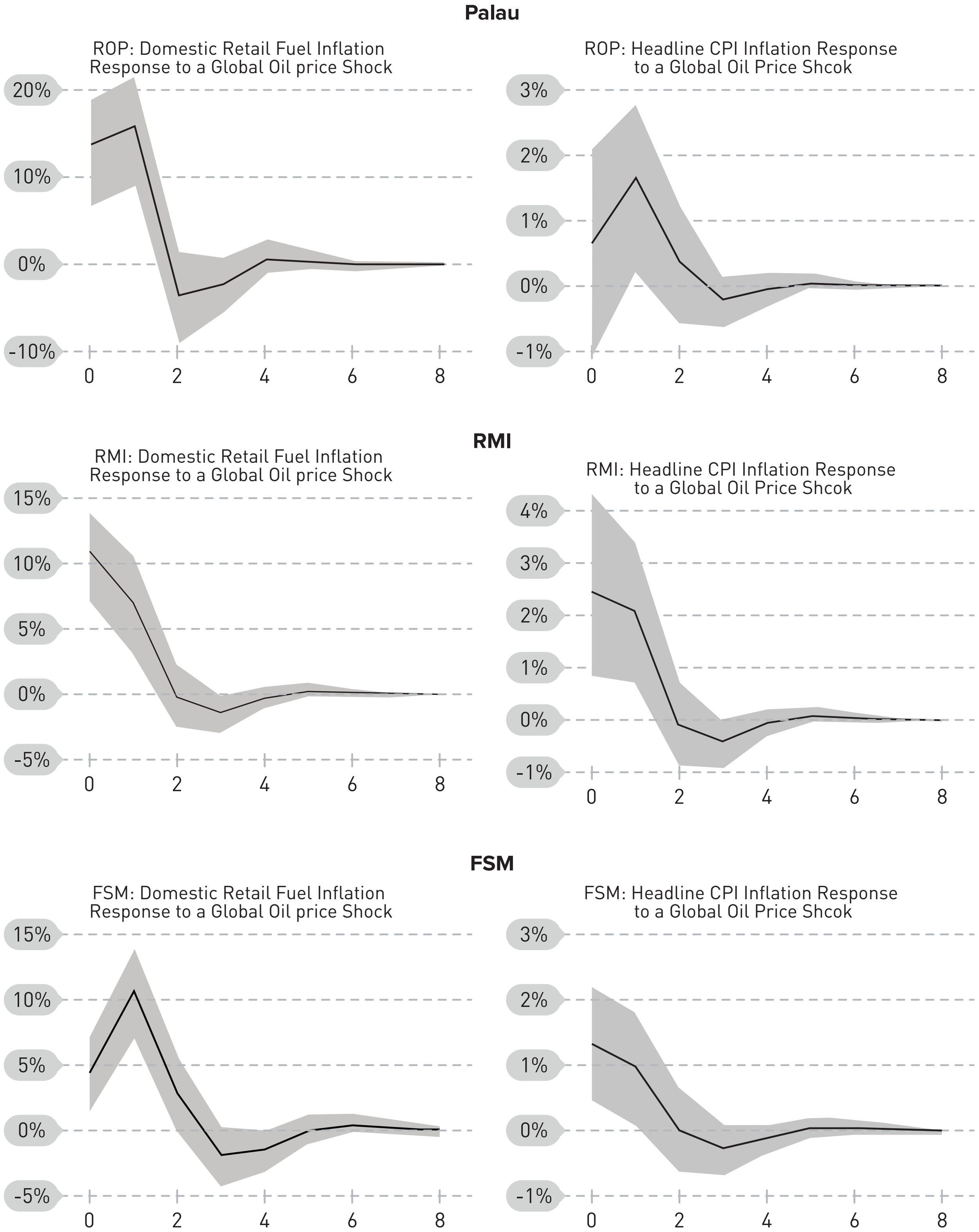
Sources: Bloomberg, Federal Reserve Economic Data (FRED) Database, Author Estimates

Annex 1: Estimated Pass-Through from Global Oil Prices to Domestic Fuel Inflation

	(1) Palau	(2) RMI	(3) FSM
Global oil price inflation (t)	0.175***	0.076**	-0.036
	(0.03)	(0.04)	(0.03)
Global oil price inflation (t–1)	0.157***	0.108**	0.116***
	(0.05)	(0.05)	(0.04)
Global oil price inflation (t–2)	0.060	0.089**	0.175***
	(0.04)	(0.04)	(0.03)
Sum (total pass-through)	0.391***	0.273***	0.256***
	(0.03)	(0.03)	(0.02)
Constant	0.02***	0.00	0.00
	(0.01)	(0.01)	(0.01)
Observations	67	67	67
R-squared	0.78	0.62	0.71
Adj. R-squared	0.77	0.60	0.70

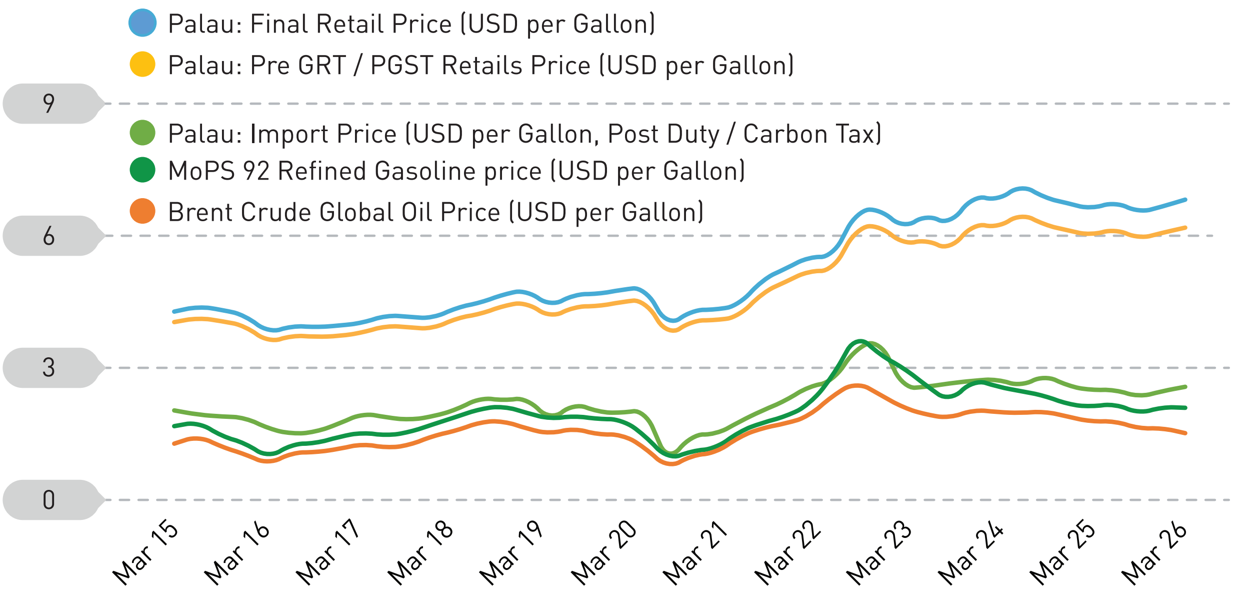
Notes
Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.10
Dependent variable: domestic transport fuel inflation (y-o-y)
Independent variables: global oil price inflation (Brent, y-o-y)

Annex 2: Vector Autoregressive Framework Analysis – Modelling a One Period 50% Quarter-on-Quarter Rise in Global Oil Prices on Quarter-on-Quarter Rate of Domestic Fuel Inflation



Sources: Author Calculations based on data from RMI EPPSO, FSM Division of Statistics, and Palau Ministry of Finance

Annex 3: A Deeper Decomposition of Fuel Prices in Palau: From Global Markets to the Pump



The domestic price of gasoline can be further decomposed in Palau[5]. The chart below plots five time series: global crude prices, global refined prices, post-duty/carbon tax import prices, pre GRT/PGST gasoline consumer prices and final gasoline consumer prices[6]. Each series captures a distinct stage of the price formation process, allowing the final retail price to be broken down into its underlying components and margins. Observing the chart below, there are some important observations to make:

» **The largest margin in the price chain is between post-duty import prices and pre-tax retail prices**. This stage reflects the mark-up applied by distributors and retailers in Palau. Between Q1 2015 and Q4 2025, post-duty import prices averaged 45% of pre-tax consumer prices for gasoline, implying that more than half of the pump price is determined downstream of importation. This likely reflects high distribution costs alongside limited competition, with scale constraints in a small market raising per-unit costs.

» **This downstream margin is larger than the entire mark-up from global crude prices to import prices**. On average, this ratio of the price of crude oil to that faced by Palau-based importers of refined gasoline came in at around 72% between Q1 2015 and Q4 2025.

» **Shipping costs appear modest and are not a major driver of final retail prices**. Refined prices account for around 90% of pre-duty import prices, implying that the margin for transport and procurement is small.

5 Due to data limitations, we are unable to undertake the same exercise for FSM and RMI.

6 In 2023, the 5 cent per gallon duty on imported fuel was replaced by a 2 cent per gallon carbon tax. At the same time, the 4% Gross Revenue Tax (GRT) – which was levied on turnover – was replaced by the 10% PGST (which acts as a VAT-style tax, meaning that it adds around 10% to the final retail price of gasoline, regardless of how costs are distributed along the supply chain.

7 To derive the pre-GRT retail price for the period prior to 2023 (before the introduction of PGST), we assume that 75% of the 4% GRT is passed through to consumers and that the domestic value chain consists of two stages: a distributor and a final retailer.

This Technical Note has been prepared by ***Liam Carson***, ***Dr. Richard Sturton*** and ***Michael Barsabal*** of the Graduate School USA's (GSUSA) Economic Monitoring and Analysis Program (EconMAP). EconMAP is supported by the Asian Development Bank and the U.S. Department of the Interior's Office of Insular Affairs, The analysis, opinions and recommendations presented in this document are solely those of the author(s) and should not be interpreted as the official position of GSUSA, its sponsoring entities, or the government of the Republic of Palau.

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