

Global Aquaculture Update 2H 2022

On the Brink of Recession

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Seafood Demand To Weaken From Peak Levels in 2H

Inflation triggers recessionary consumer behavior

Demand drivers

- Recessionary dynamics have already started in both the EU and the US in the midst of their Covid recoveries.
- Foodservice demand for seafood will cool in both regions, which means another switch back to retail.
- China is the most unpredictable factor in 2H 2022. Potentially, there is considerable upside for both shrimp and salmon, especially in Q4 2022, as long as Covid-related lockdowns and import restrictions are not reintroduced.

Key dynamics

- **Expect weaker demand for seafood in 2H 2022 compared to both 2H 2021 and 1H 2022.**
- **Production costs are persistently high, driven by feed, freight, and energy, with no reduction expected in 2H.**
- **Both salmon and shrimp prices will correct from record levels. Fish meal prices are likely to be supported by the high prices of alternatives.**

Supply drivers

- Salmon supply will improve in 2H, compensating for the supply contraction in 1H. This year's growth is still the lowest since 2016.
- Shrimp supply is expected to grow in 2H 2022, though at a decreasing pace as farmer profitability approaches breakeven.
- Despite a high first season quota, Peru's fish meal production will not surpass 2021. Good production in other parts of the world is unlikely to offset the loss.

Looking back

- **Both salmon and shrimp experienced a period of record demand and record prices in 1H. However, supply dynamics contrasted, with strong supply growth in shrimp and the largest contraction (-6%) in salmon supply since 2016.**
- **This allowed the industry to maintain high levels of profitability despite rising costs.**
- **1H marked a strong supply period for fish meal, as the winter season in Peru (which starts in late 2021) was near perfect. Prices increased, however, as alternative feed proteins, such as soymeal, experienced record price levels.**



Global Aquaculture Market Outlook: A Cooling Market Amid Good Demand and High Input Costs in 2H 2022

North America

- The US remains a strong demand driver for seafood, but foodservice demand is clearly declining.
- We expect demand to cool off from record levels in 2H 2022 and to shift back to retail.
- This could be the beginning of a long challenging period in the US.

Europe

- Two opposing dynamics make for an unpredictable demand function in Europe in 2H: recovery from Covid and recessionary behavior.
- The Nordic salmon industry will experience a supply recovery in 2H but will also face lower, albeit still high, prices.

China

- China has the potential to be the key driver of demand for shrimp, and possibly salmon, in Q4 2022.
- However, Covid lockdowns and import restrictions greatly decrease the probability.
- We remain optimistic that China will once again become an important driver of shrimp and salmon demand before the end of the year.

South America

- Ecuador continues its rapid expansion of shrimp supply despite lower prices.
- Following a delayed start, Chile's salmon supply recovery is expected to strengthen in 2H.
- Despite the slow start to the 2022 summer fishing season in Peru, supply and prices will be favorable.

Southeast Asia

- After an incredible recovery in 2021, India struggled to match shrimp export levels early this year. Though difficult to estimate, shrimp harvests are unlikely to match 2H 2021 levels.
- Export growth continues in Vietnam and Indonesia.



1

Salmon: Tight Supplies To Improve in 2H 2022

Salmon Prices Reached New Records in 1H 2022

Prices have cooled off their peak but will remain above average in 2H, supported by other high-priced proteins

- Supply will improve in 2H 2022
- Prices will cool off their peak but remain elevated
- Costs will remain high through at least 2H 2022

Strong demand of 1H to cool off in 2H 2022

Recessionary dynamics resulting from declining disposable incomes among consumers in key markets mean another shift towards retail and away from foodservice. This typically means that demand for salmon will cool down. However, it is worth noting that salmon demand would cool down from record levels and is expected to remain strong in 2H 2022. In the key European market, retail salmon consumption is high, meaning demand loss will be limited when foodservice sales contract.

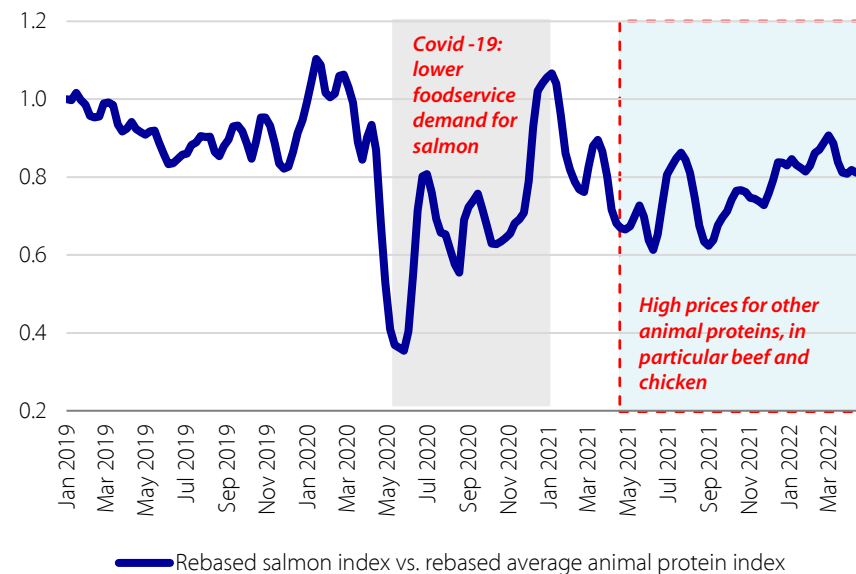
Supply trends to reverse in 2H

For most supplier regions, and especially Norway, supply in 1H 2022 was weak, resulting in a global contraction of 6%, the highest negative supply growth since 2016. This supply dynamic will reverse in 2H, with both Norway and Chile contributing growth approximately equal to the contraction seen in 1H.

Farmer profitability to decline from high levels

A large part of 2021 and 1H 2022 was marked by record salmon farmer profitability, driven entirely by high price levels. Prices are expected to partly normalize but remain high in 2H. However, we expect production costs to increase. Due to the long production cycle, high feed costs have yet to be fully incorporated into the cost function. These dynamics combine to reduce farmer profitability in 2H, but we still expect the industry to generate healthy positive margins.

Despite high prices, Atlantic salmon in the US is at a slightly lower relative price point than before the pandemic



Note: Relative salmon prices are a comparison of Chilean salmon fillets versus select US proteins

Salmon price:

- Urner Barry Salmon, Fil, Chile Atl, D-Trim, FOB Miami, 2-3lb

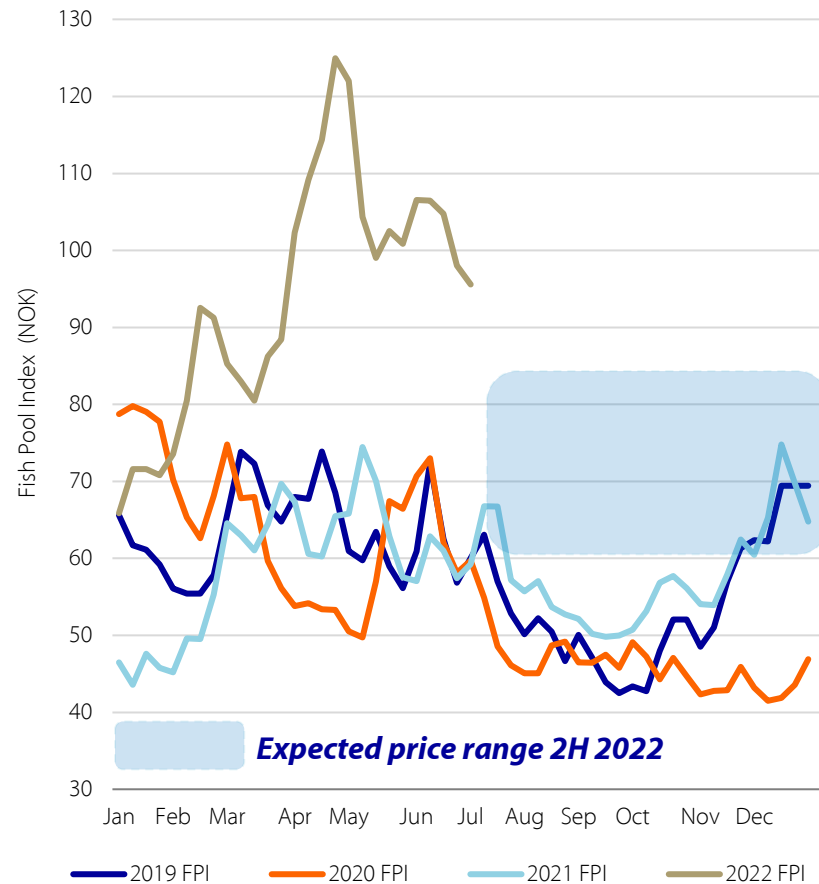
Composition of average protein price index:

- USDA beef loin, Choice cut (600-900)
- USDA pork loin, FOB plant negotiated sales
- USDA boneless chicken breast, broiler parts

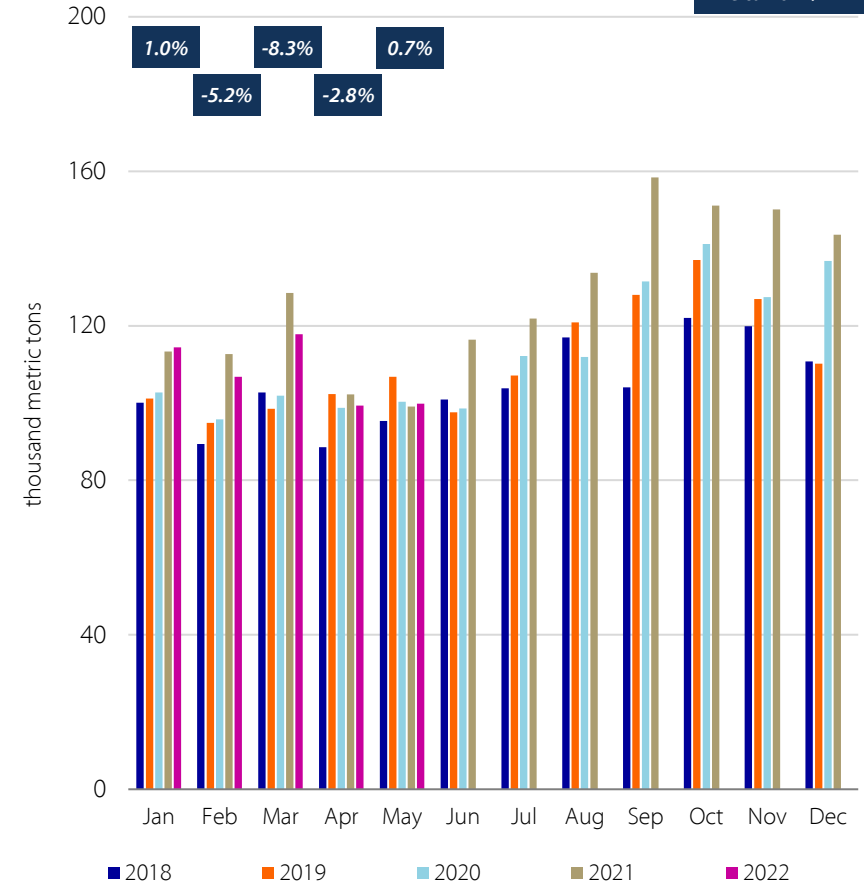
European Salmon Prices To Correct After New Records in 1H 2022

Nevertheless, higher-than-average levels are expected for the rest of the year

A partial normalization is expected after Q2's peak



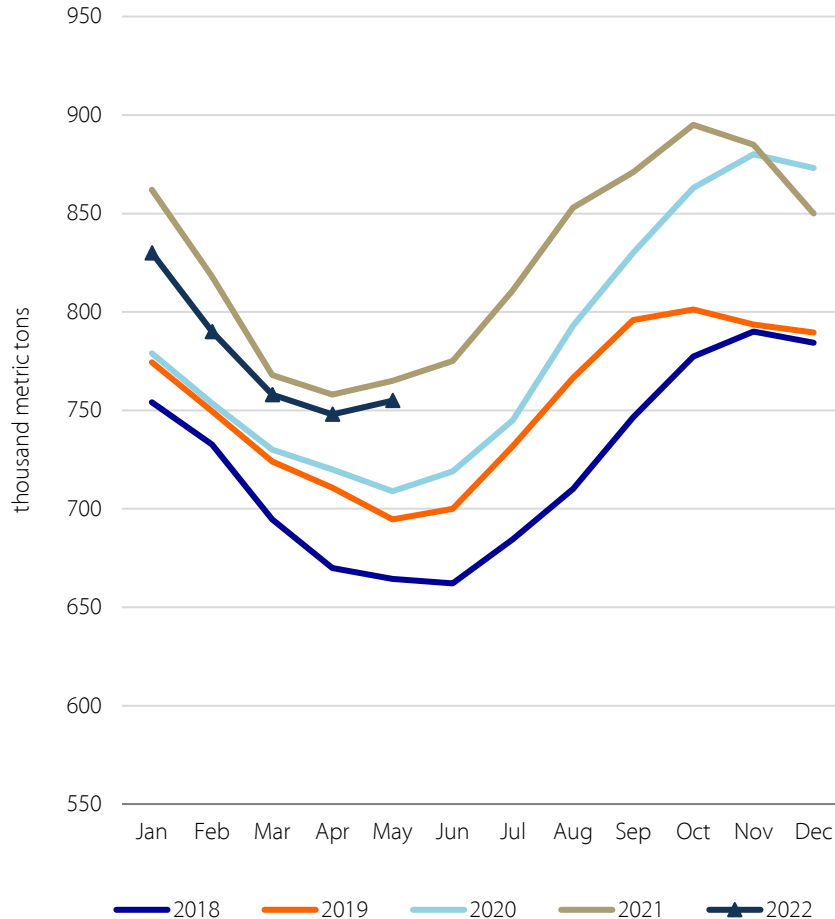
After negative growth in 1H, Norwegian salmon exports should become positive in 2H



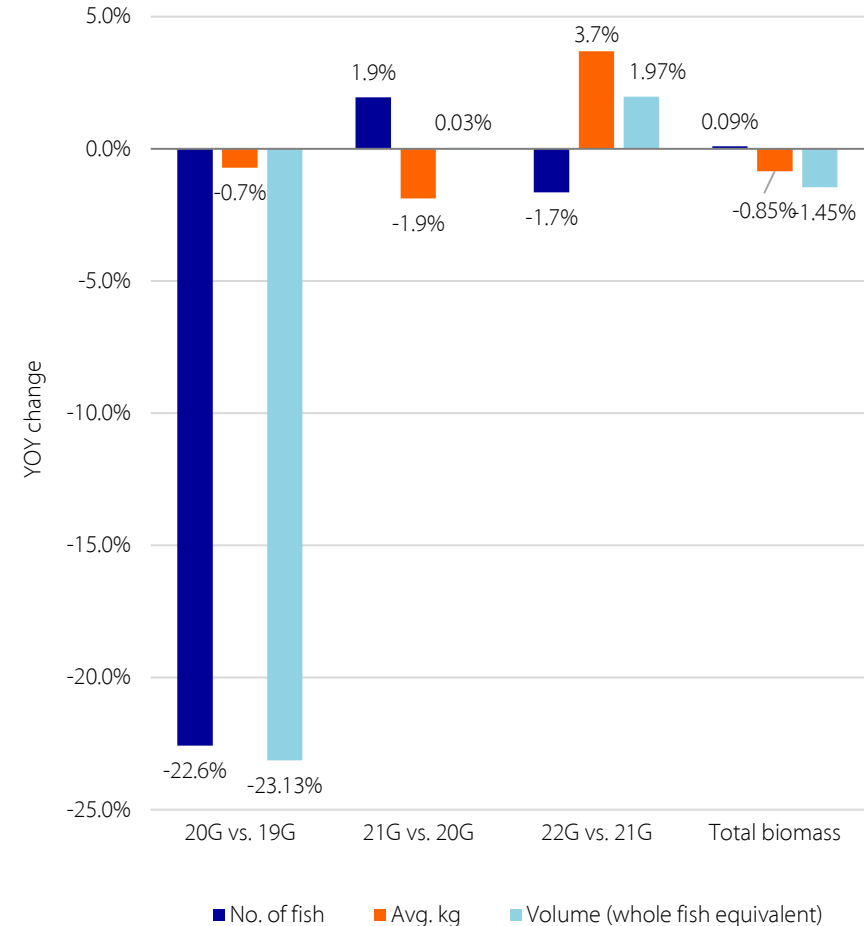
Norway: Biomass Below 2021, Which Had Near Perfect Conditions

Norwegian harvesting should reach a turning point and a return to growth in early 2H

Replicating the strong biomass growth of 2021 proves hard



Biomass composition reveals lower fish numbers of 20G*

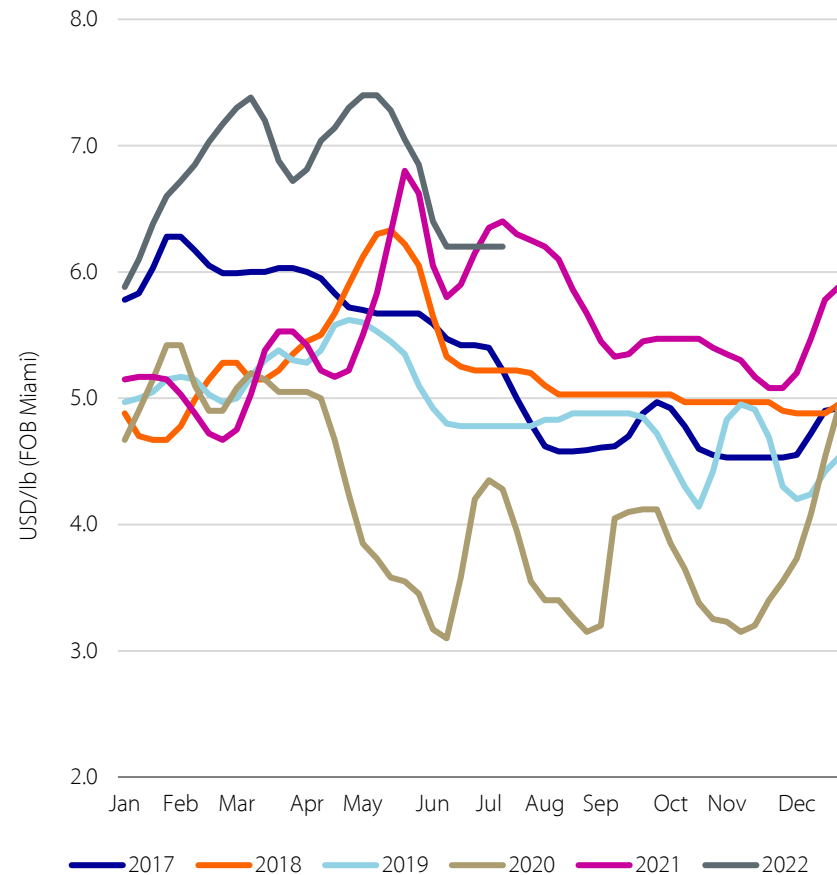


*Note: 'G' denotes generation (i.e. the fish placed in sea cages that year). 20G is the main generation to be harvested in 2022.
Source: Kontali, Rabobank 2022

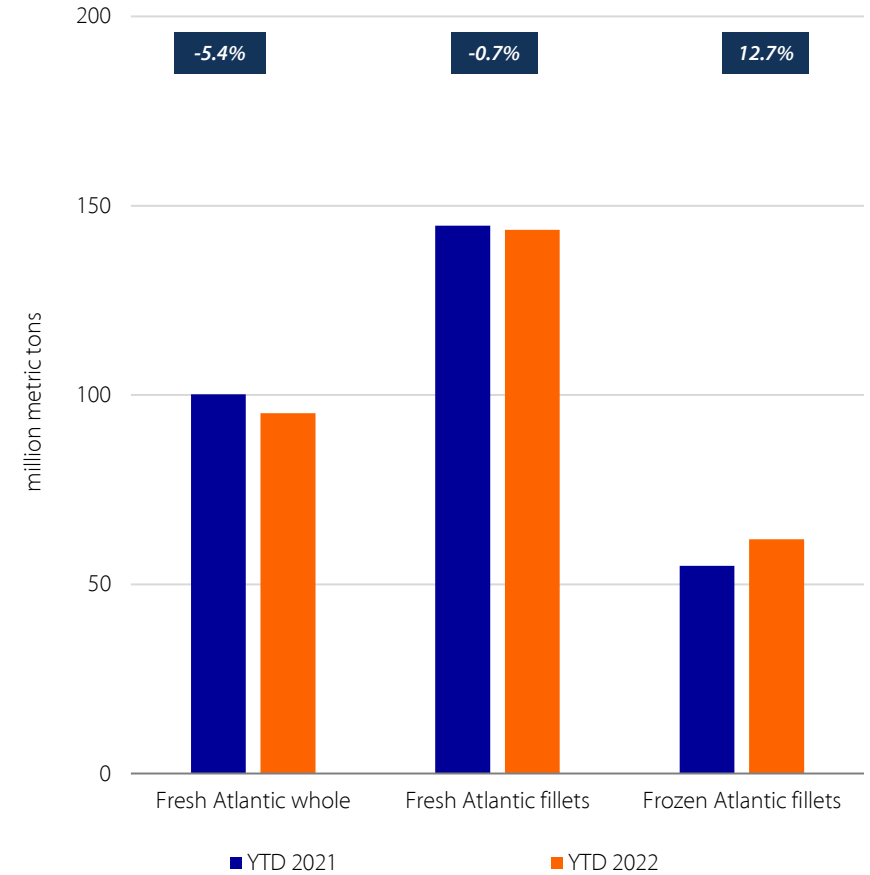
US Market: Partial Normalization of Record Prices Expected in 2H

However, prices are likely to remain supported above historical levels

Chilean fresh fillets in the US*, 2lb to 3lb, are normalizing after reaching new records



The US market increased by 0.5% YTD April 2022, with frozen fillets once again the best performing category

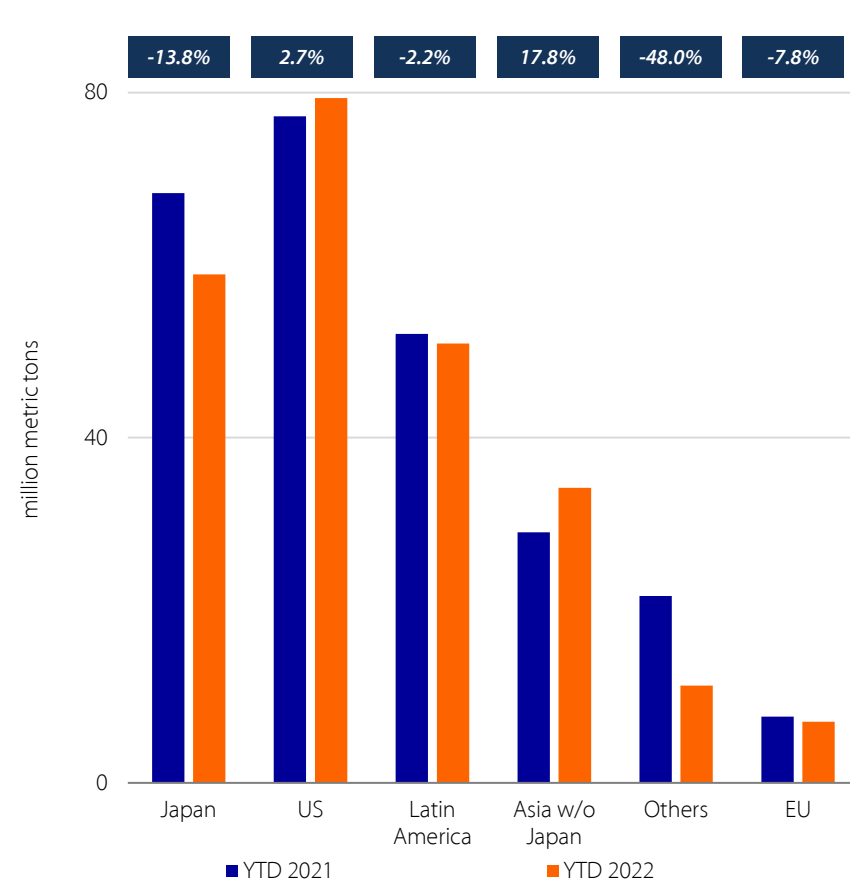


*Fillet prices to the US include UB salmon, farmed, fillet, and fresh salmon, Chilean Atlantic salmon, and D-Trim salmon.
Source: Urner Barry's Foreign Trade Data, USDOC, Rabobank 2022

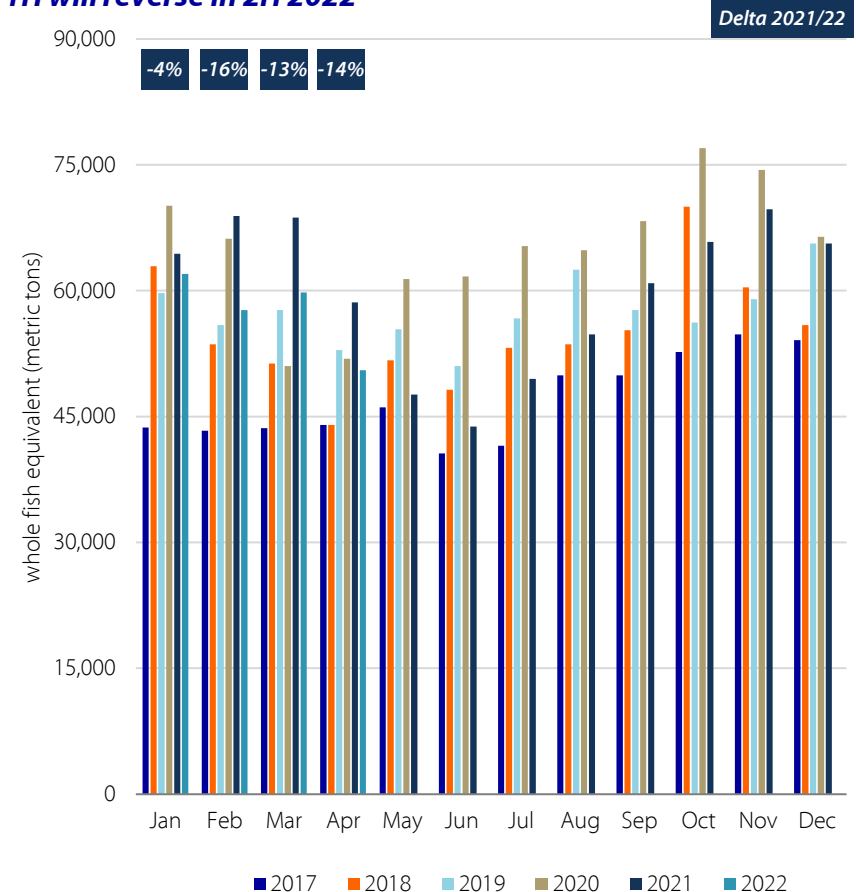
Chilean Salmon Production: Supply Growth To Resume in Early 2H

Harvests have been declining since early 2021, but growth will resume in the middle of 2022

Chilean exports were down by 5.6% YTD April 2022, but the US remained well supplied



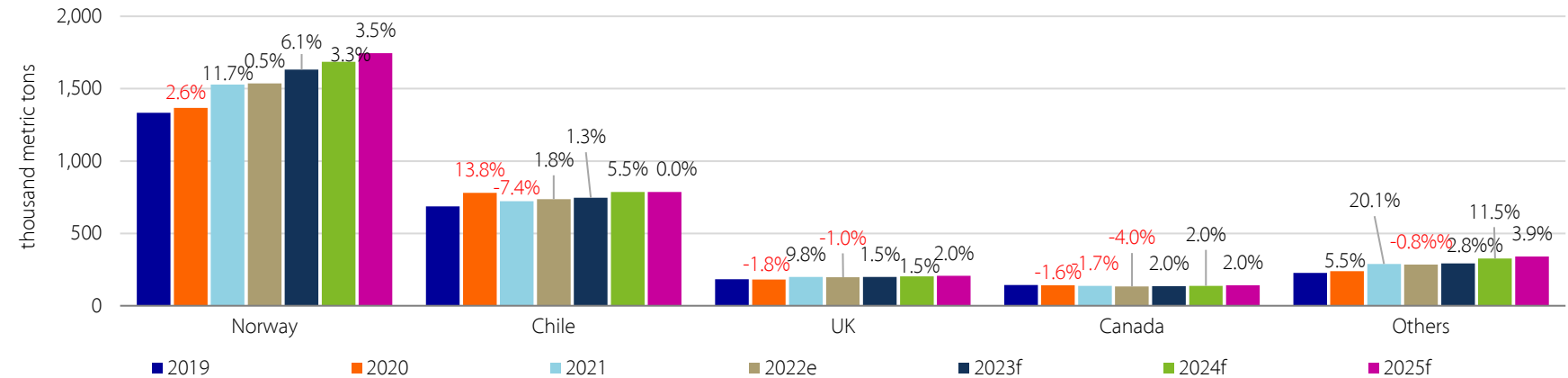
The contraction in Chilean Atlantic salmon harvest quantity in 1H will reverse in 2H 2022



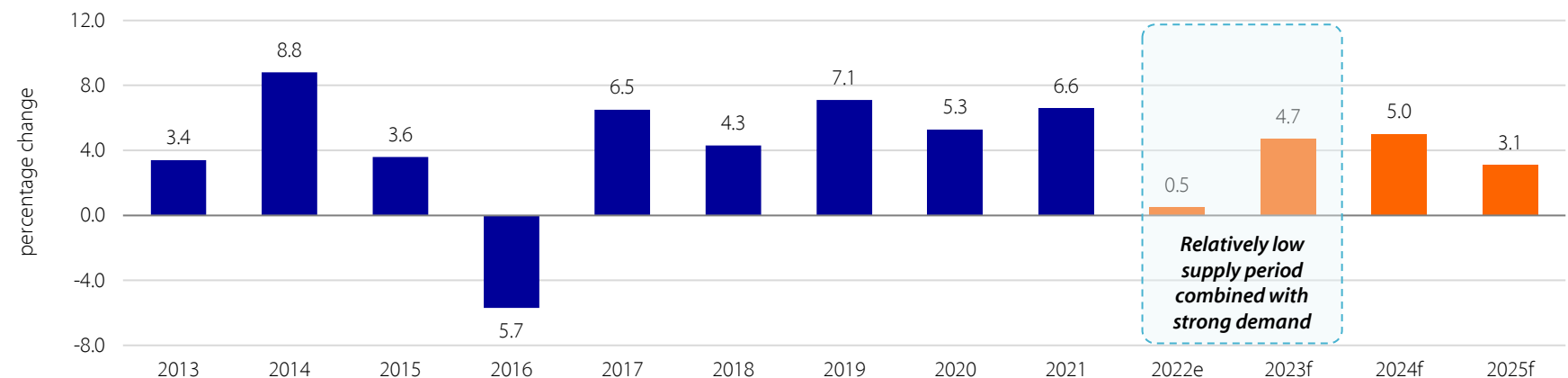
Despite Improving in 2H, Full-year Supply Growth Will Barely Be Positive

Global supply's 6% contraction in 1H is expected to reverse in 2H

Global supply per producer, 2019-2025f



Global supply growth of Atlantic salmon, 2013-2027e





2

Shrimp: Challenges Ahead in 2H 2022

Shrimp Prices on a Downward Trend Since March 2022

A challenging 2H of high costs and lower prices expected if supply growth continues

- The US and EU markets will likely cool off in 2H 2022
- Most exporters are still expanding supply despite lower price levels
- With lower prices and high costs, 2H will challenge many farmers

Slowing demand growth in the US and EU

The US and EU drove shrimp demand in 2021 and the early part of 2022. But this demand growth is likely to cool off, as inflation has reduced disposable incomes in 2H 2022. China's shrimp demand is hard to predict. Shrimp imports improved strongly but are still below pre-pandemic levels, suggesting considerable upside. However, the key limiting factors of Covid lockdowns and import restrictions remain unpredictable.

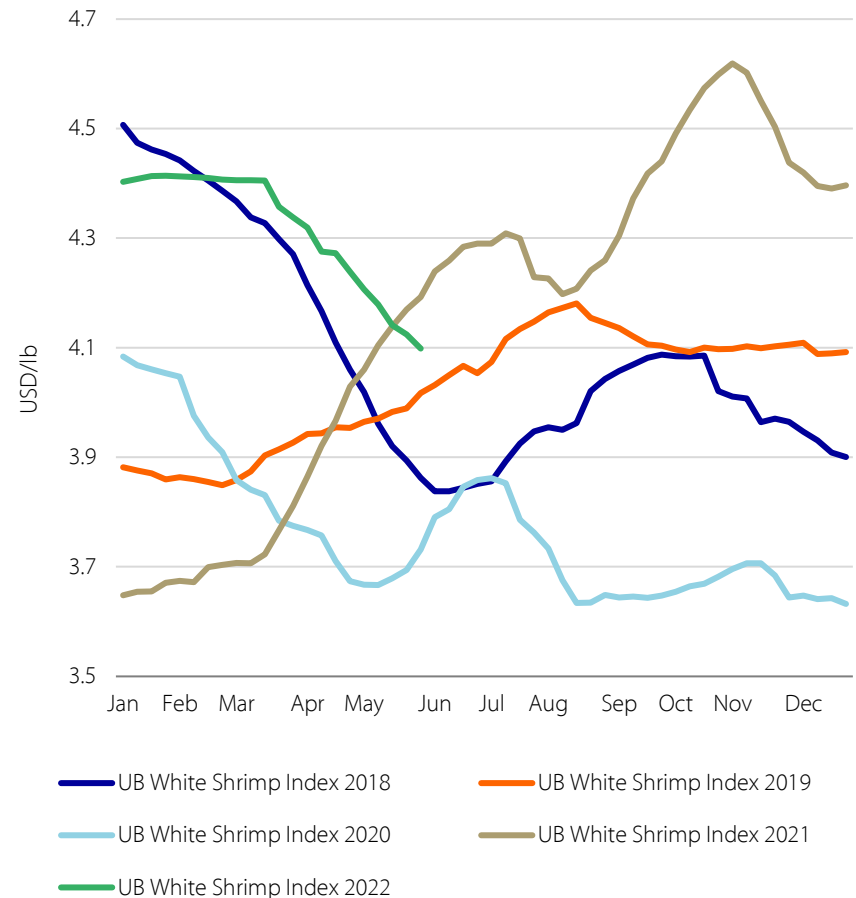
Shrimp supply still seems to have strong momentum

Indonesia, Vietnam, and especially Ecuador still seem to be on a growth path even as 1H prices have corrected and costs have increased. Shrimp that will be harvested in 2H were placed in ponds during 1H, most likely with the expectation that prices would be good, suggesting the industry's reaction to market conditions will be delayed.

2H 2022 could be a challenging period for farmers

The high costs of feed, freight, and energy are expected to remain in 2H 2022. However, if shrimp supply continues to expand as it did in 1H or if demand further declines due to recessionary consumer behavior, we may see prices below breakeven for farmers. In some cases, this has already occurred. As in many other agricultural sectors, supply only responds when farmer profitability is clearly impacted. We remain optimistic about the long-term prospects of the shrimp industry but expect a challenging period in the short term.

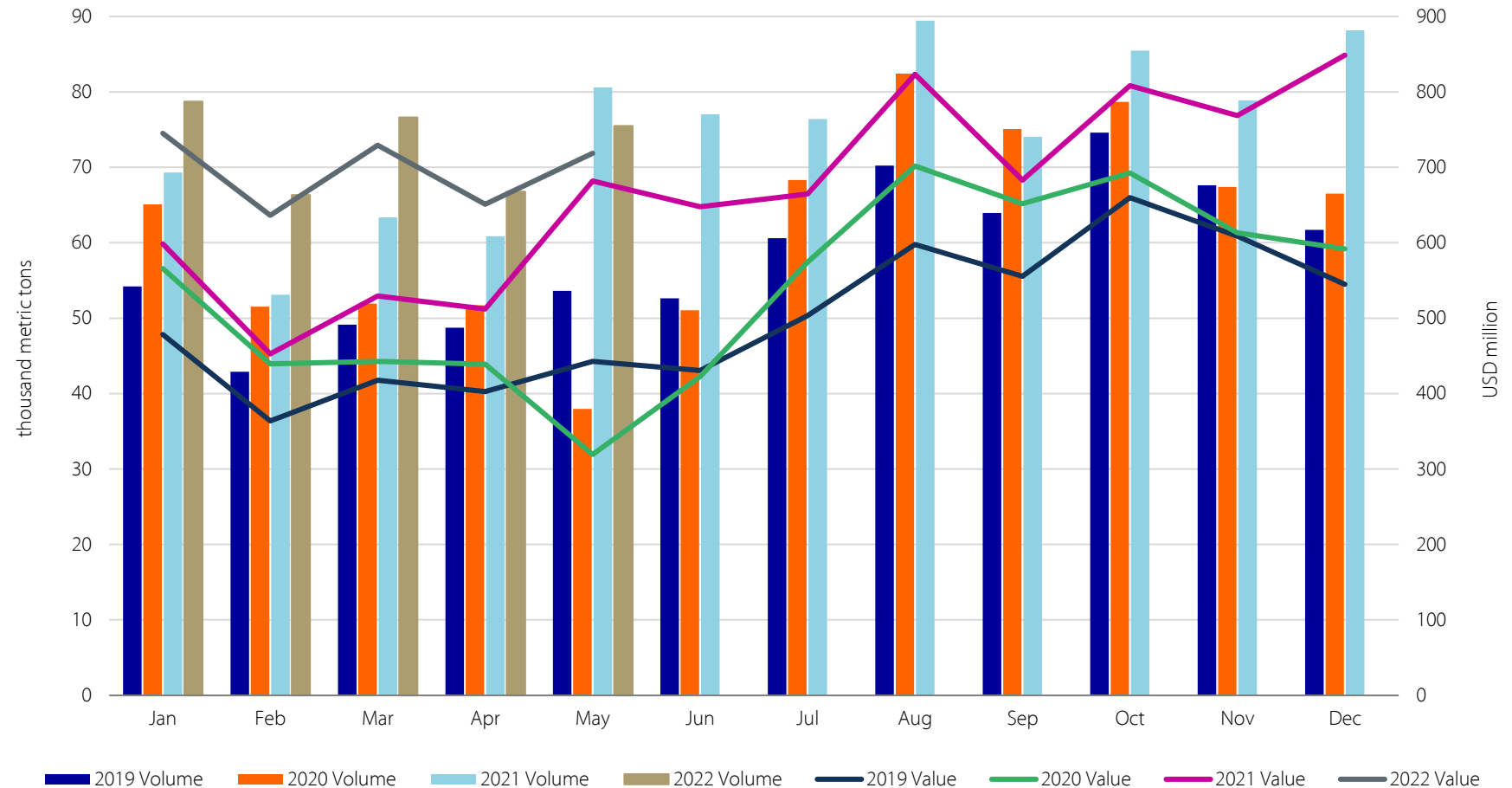
Urner Barry White Shrimp Index: Prices have fallen below pre-pandemic levels



US Shrimp Market: Recessionary Dynamics To Shift Demand Back to Food Retail

Despite a strong start, US foodservice demand will cool in 2H on worsening macroeconomics

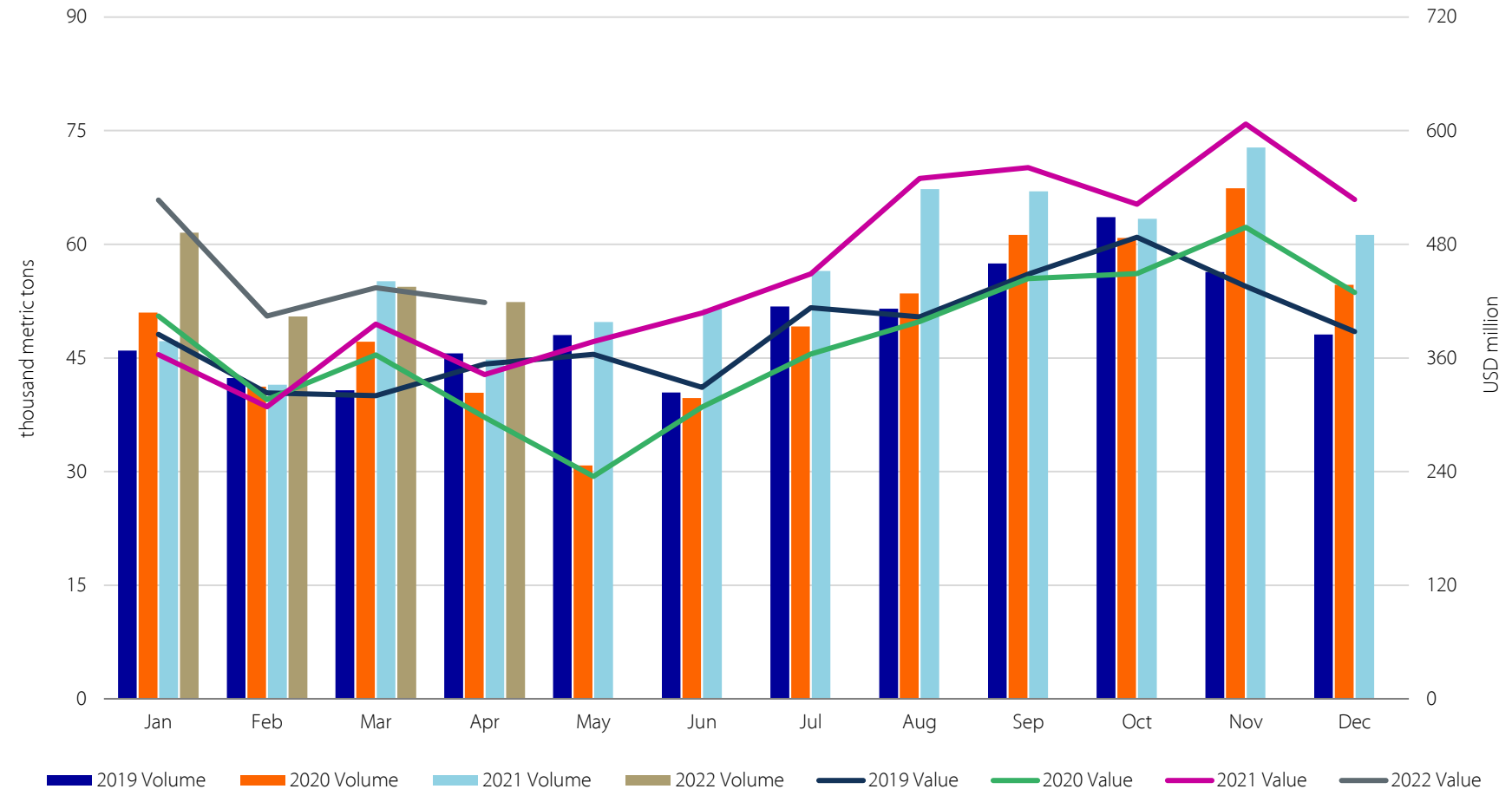
US shrimp imports jumped 25% in value and 11% in volume, YTD May 2022, supporting prices, but this is unlikely to repeat in 2H



EU-27+UK Shrimp Market: Strong Recovery Should Slow in 2H

Shrimp consumption's strong growth will weaken in 2H 2022 as EU-27+UK consumers face inflation

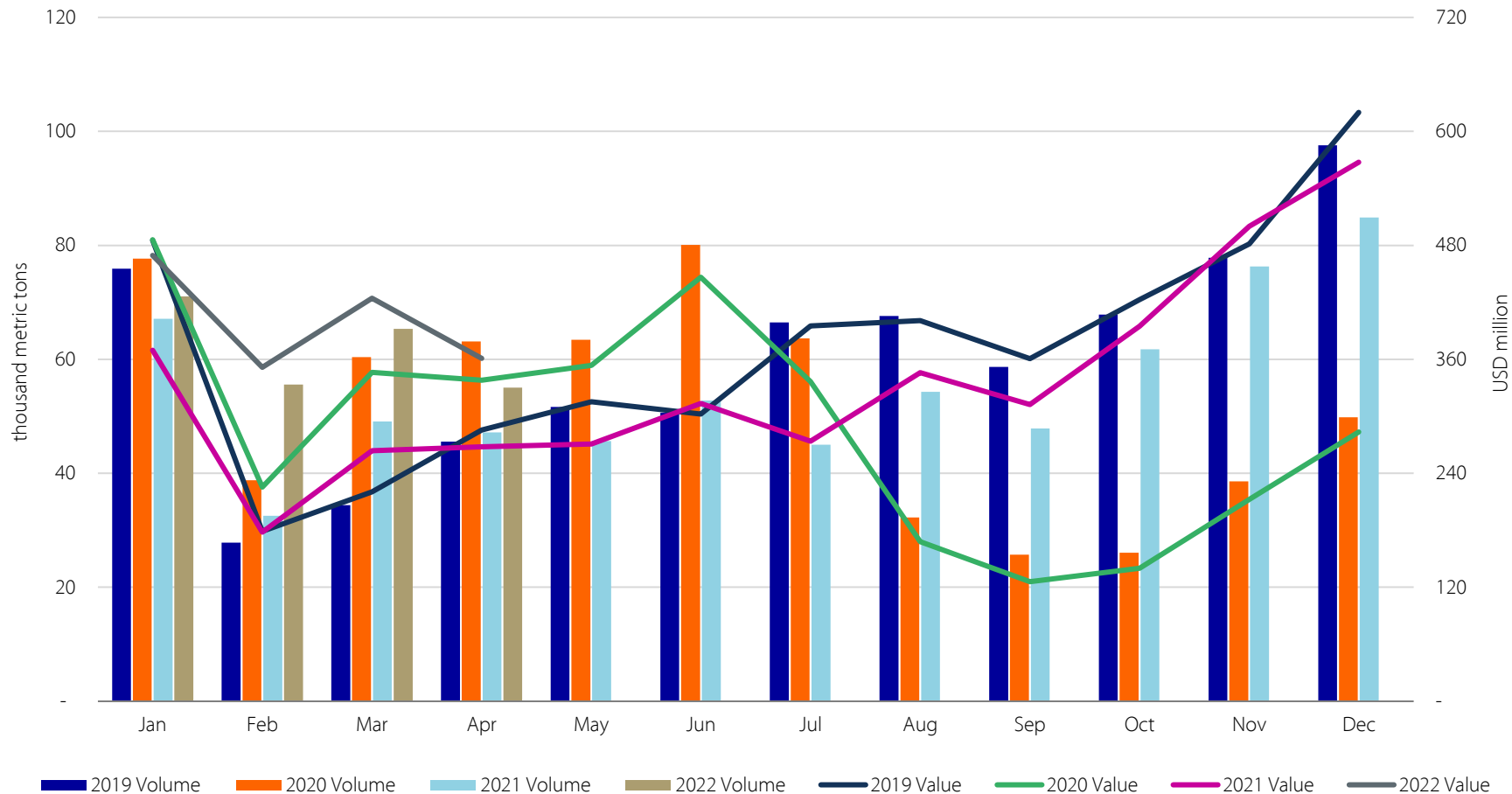
EU-27+UK frozen tropical shrimp imports are up 26.5% in value and 16.0% in volume, YTD April 2022



Chinese Shrimp Market: 2H 2022 Upside Potential Is Vulnerable to Lockdowns and Import Restrictions

After a strong Q1, shrimp imports face uncertainty of Covid lockdowns and import restrictions

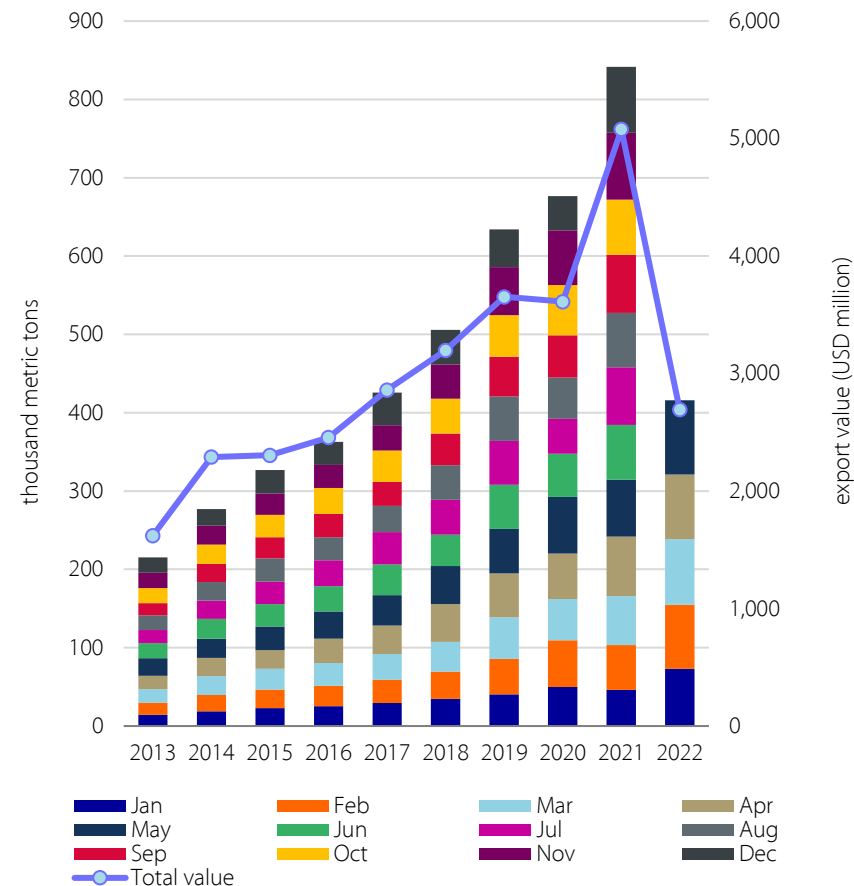
China's shrimp imports are up by 48.9% in value and 26.1% in volume, YTD April 2022



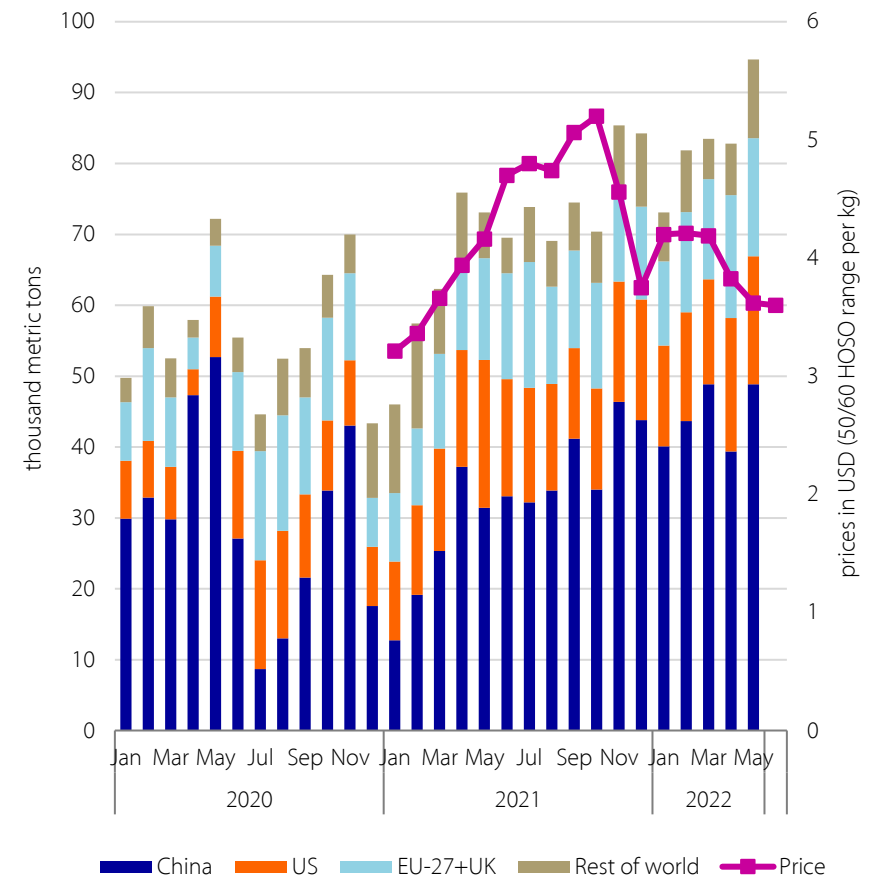
Ecuador: Maintaining Industry-leading Supply Growth

Despite considerable price declines and higher feed costs, record supply expansion suggests a potential 1.3m metric tons for the full year

Ecuador's exports have expanded in 2022 (up 32.1% YTD May 2022), continuing their long-term growth



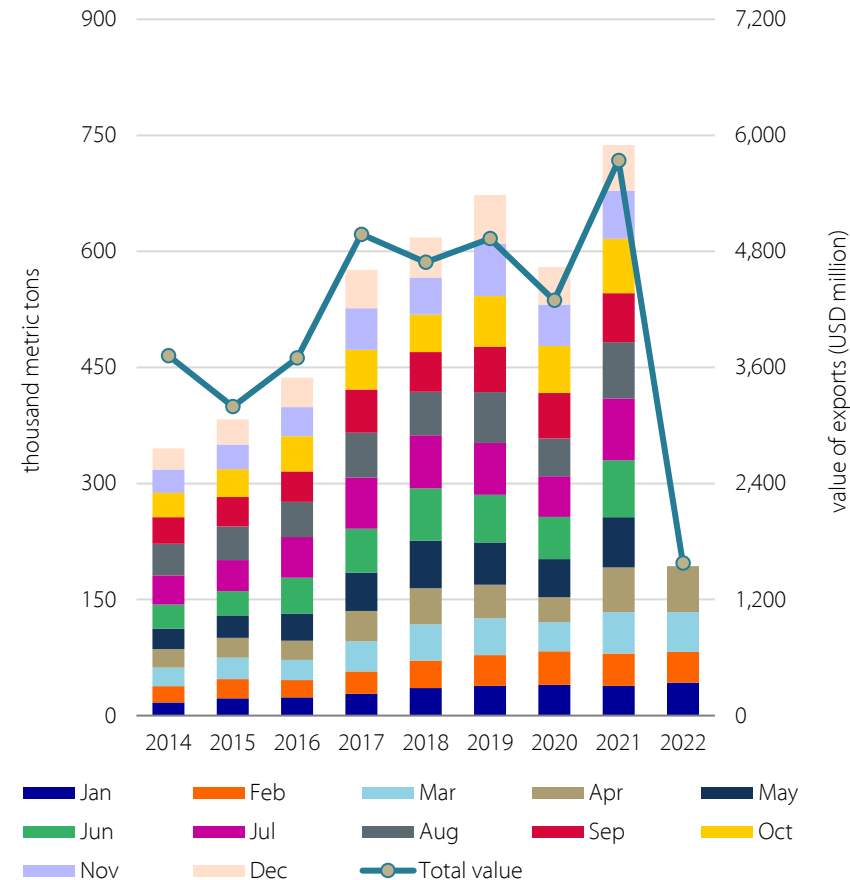
Ecuador's exports are once again pivoting towards China as that market recovers



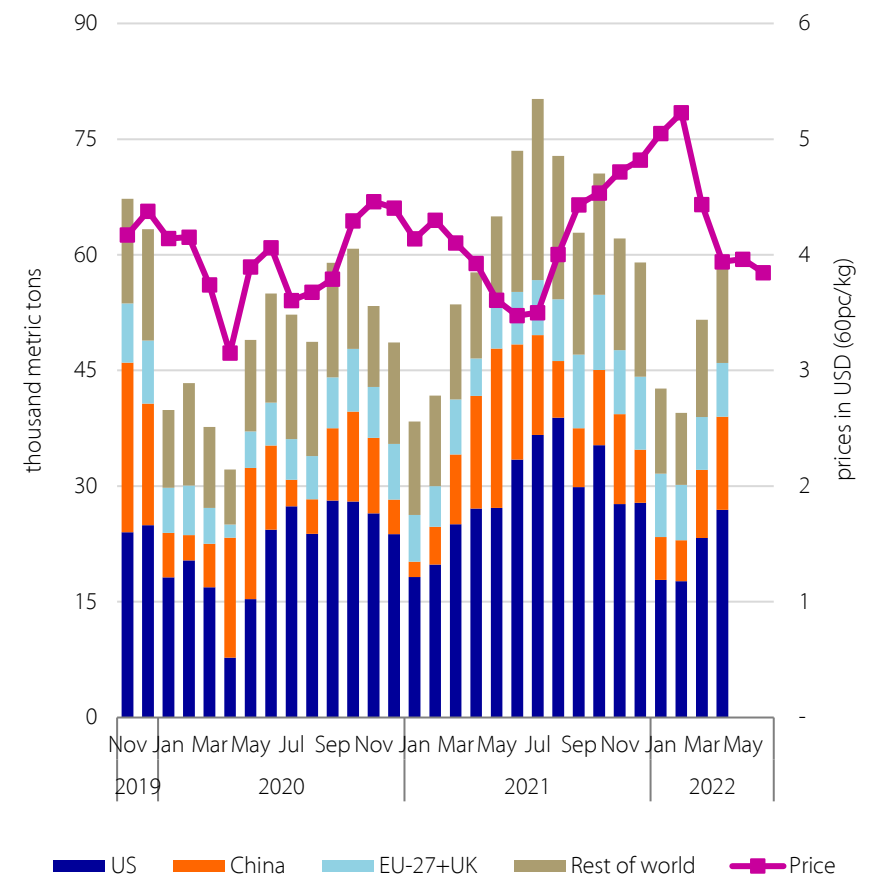
India: Production Growth Flattens After a Stellar 27% Rebound in 2021 Volumes

Higher costs and higher mortalities are the main causes

Indian shrimp export volumes have grown by 1% YTD April 2022



India, the leading supplier to the US, faces competition from Ecuador and Indonesia



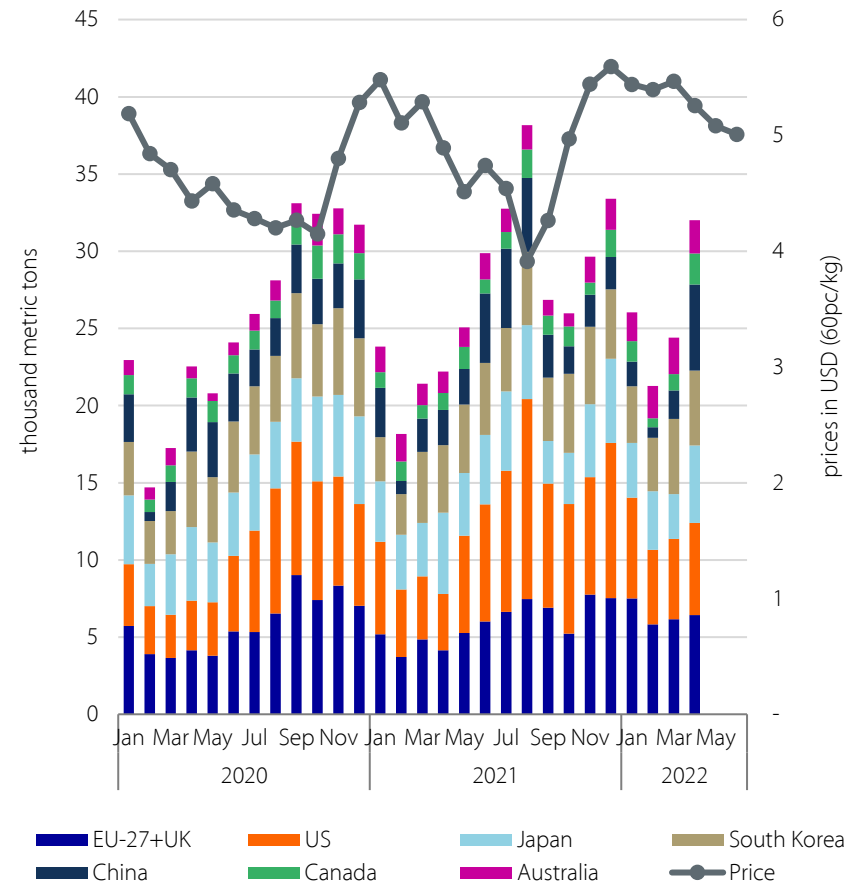
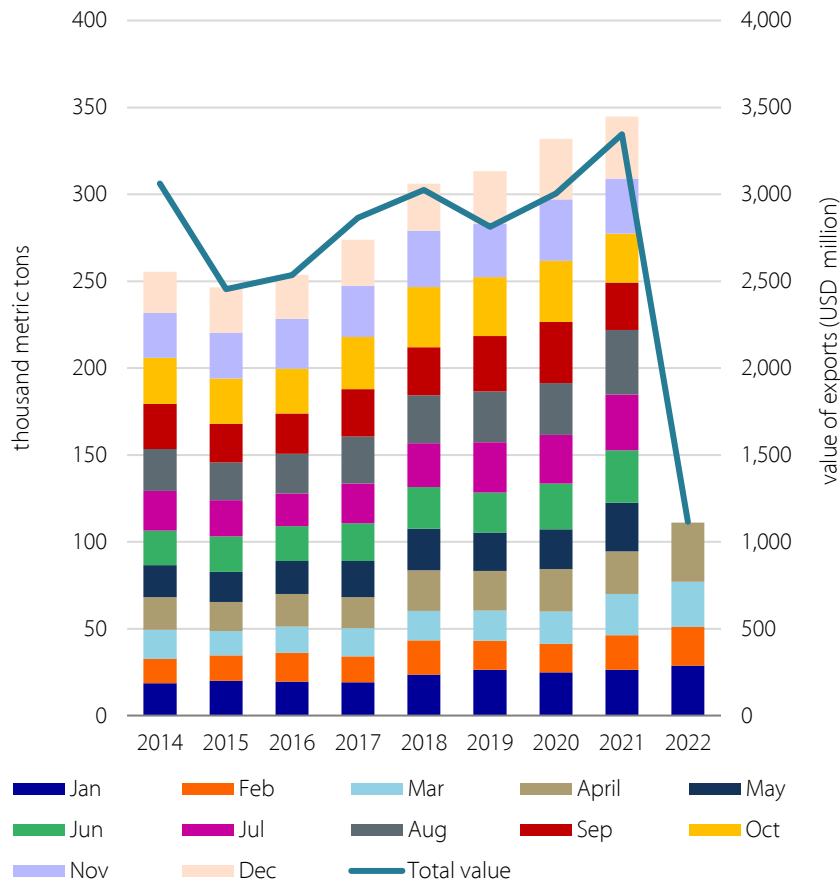
Vietnam: Consistent and Steady Growth Continues in 2022

It remains unclear if this can be maintained in 2H 2022, given adverse cost and price changes

Relative to 2021, Vietnam's export volumes increased 18% YTD April 2022

A well-diversified exporter with limited exposure to China, Vietnam is shifting focus based on relative demand

Shrimp



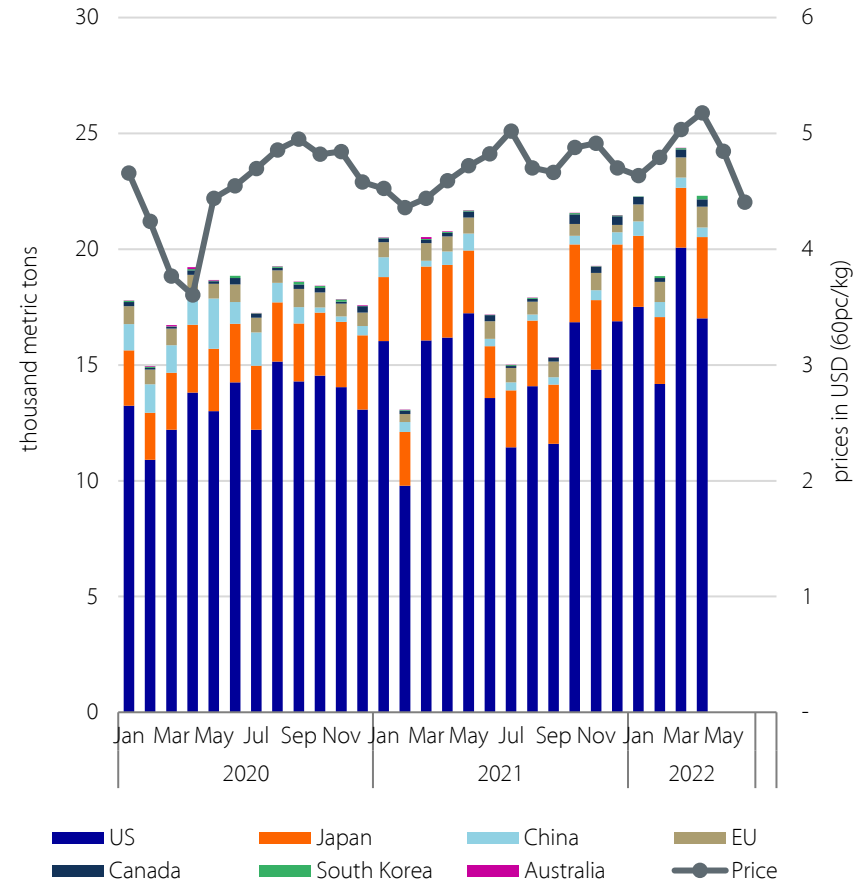
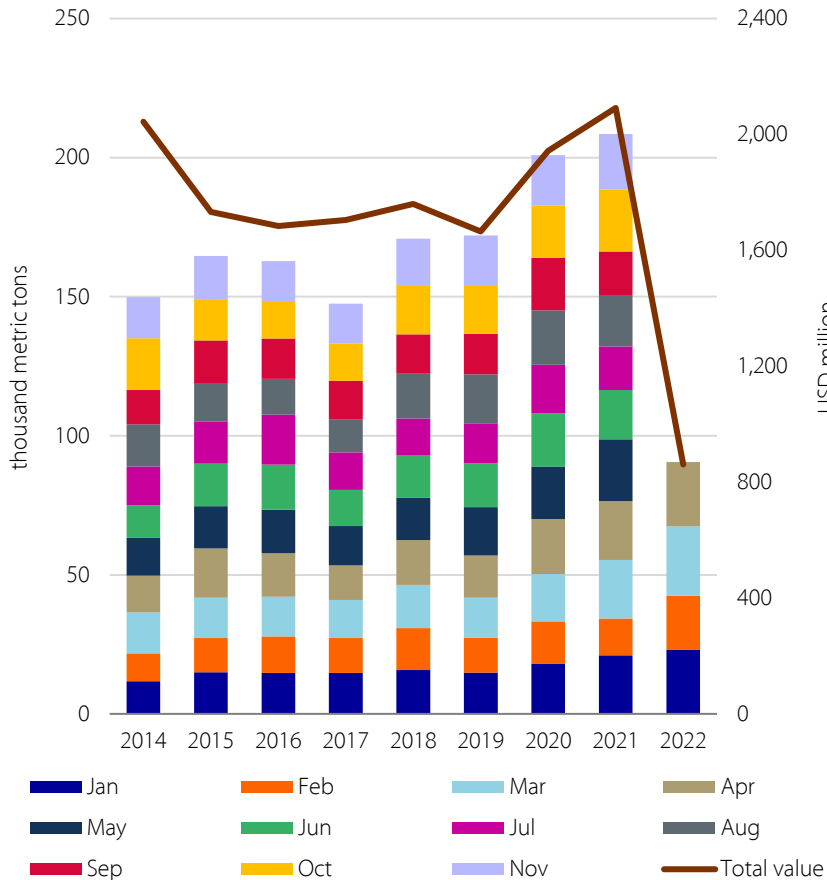
Indonesia: More Growth Is Expected To Follow 2021's Strong Expansion

Indonesian exporters are driven by strong demand in their main market, the US

Indonesia's export volumes increased 18% YTD April 2022

Indonesia is more focused on the US (76% of exported volumes) than other exporters – with positive results thus far

Shrimp



A large school of small, silvery fish, likely anchovies or sardines, swimming in clear blue water. The fish are densely packed in the upper half of the frame, creating a textured, shimmering effect. The water transitions from a deep blue at the top to a lighter, turquoise blue at the bottom.

3

Fish Meal: Still Supported by High Commodity Prices

Fish Meal: 2H 2022 Supply Will Be Similar to Last Year's

- Fish meal supply will be slightly below or the same as last year in 2H 2022
- Demand is primarily impacted by the high prices of vegetable substitutes
- Fish meal prices are likely to be supported in 2H 2022

Fish meal supply will be roughly the same in 2H 2022

Peru had a near perfect 2021, but it seems 2022 will not repeat this. Although the summer 2022 quota is the largest since 2019, at the time of writing, it is unsure if it will be fully caught. A small amount may remain unfished. On the other hand, the northern hemisphere is having a strong fishing season throughout the year, especially due to a good Icelandic capelin total allowable catch. Nevertheless, according to the IFFO, the net effect on full-year production (with most supply coming after June 2022) of fish meal is a slight contraction. For fish oil, flat supply is expected due to the growing relevance of rendered products from the aquaculture sector (such as pangasius and salmon oil).

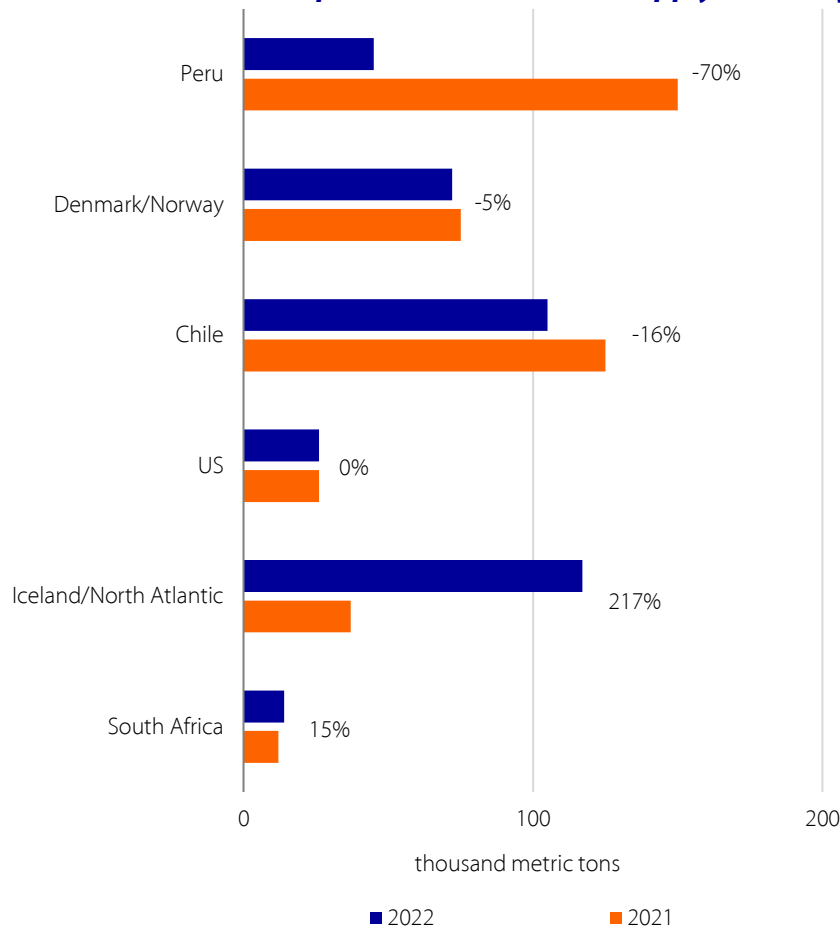
Demand primarily impacted by the high prices of substitutes

The global aquaculture industry will only have minor growth in 2H. There is some growth in salmon and shrimp, but with flooding in China (by far the largest importer), there are challenges. However, high fish and piglet prices in China could be a driver of fish meal demand (as farmers are less concerned about cost and focused on the quality of feed). Most importantly, all vegetable proteins and oils (substitutes for both fish meal and fish oil) are at record levels. This makes marine ingredients relatively competitive in feed formulas, supporting demand.

Prices should be supported in 2H

Our expectation is that prices for both fish meal and fish oil are likely to be supported in 2H 2022. Stable supply combined with a still favorable fish meal/soymeal price ratio means there is limited downside to prices. The upside could be if fishing in Peru or elsewhere turns out to be more challenging than it has been recently.

A slow start in Peru impacted 2022 fish meal supply (YTD May)



Fish Meal Supply Among Leading Producers Decreased 3% in Q1 Due to a Slow Start in Peru

Full-year production is expected to be only slightly lower than 2021 production

Fish meal production by the IFFO-8, the leading regions producing fish meal from wild catch, increased in 2021

Fish meal production by country (thousand metric tons)

	January-May			May		
	2021	2022	22/21	2021	2022	22/21
Peru	150	45	-70%	8	10	20%
Denmark/Norway	75	72	-5%	17	23	35%
Chile	125	105	-16%	23	20	-13%
US	26	26	0%	10	12	13%
Iceland/North Atlantic	37	117	217%	6	36	498%
South Africa	12	14	15%	5	2	-70%
Total	457	422	-8%	77	115	49%

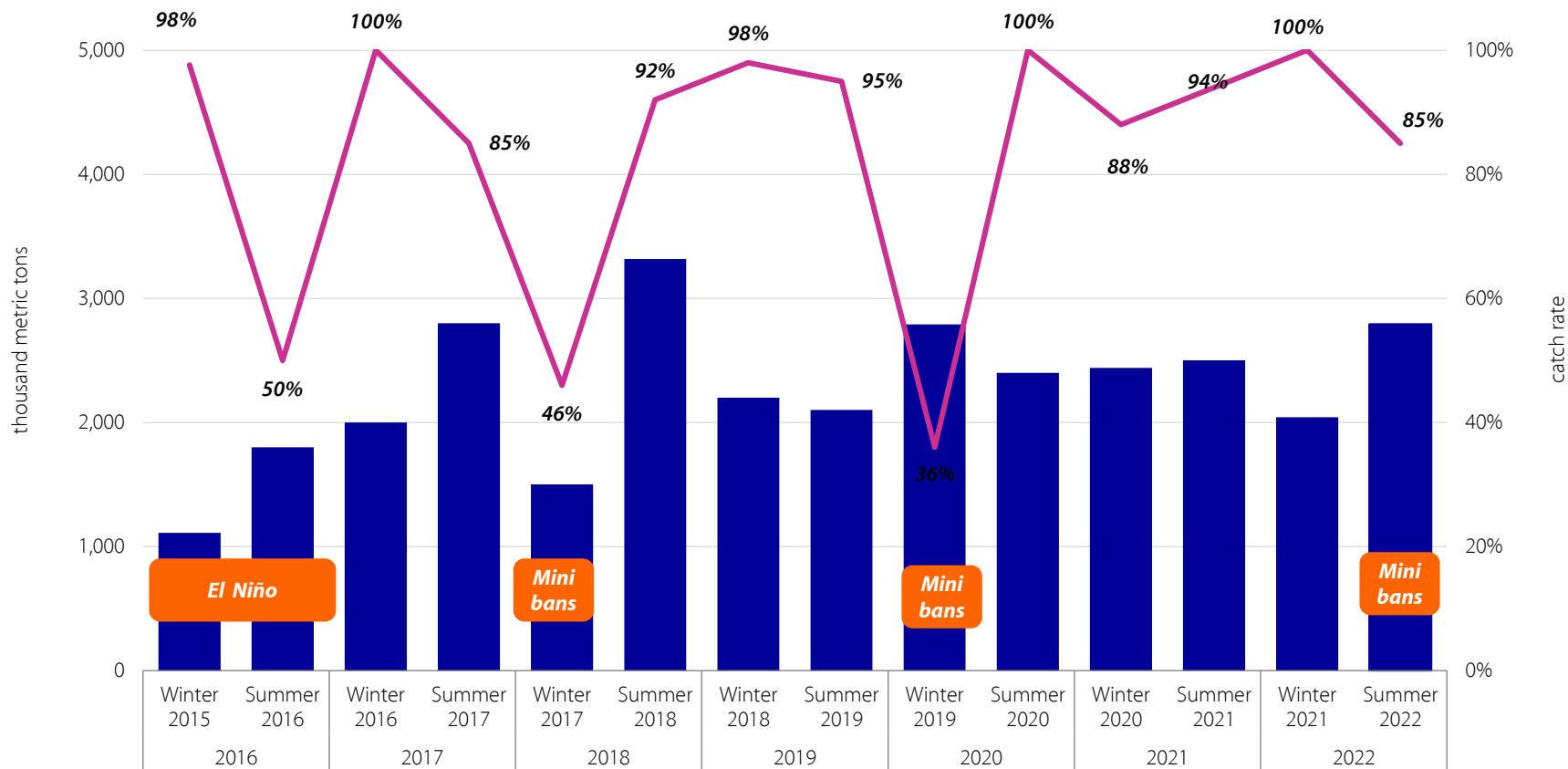
Fish oil production by country (thousand metric tons)

	January-May			May		
	2021	2022	22/21	2021	2022	22/21
Peru	35	3	-90%	1	1	29%
Denmark/Norway	18	24	34%	5	9	79%
Chile	54	45	-18%	12	11	-8%
US	4	4	24%	2	2	35%
Iceland/North Atlantic	8	48	504%	1	17	1343%
South Africa	1	2	88%	0	0	12%
Total	124	131	5%	22	42	92%

The High Summer 2022 Quota in Peru May Not Be Fully Caught

Large numbers of juvenile fish in the biomass delayed the early part of the season, but fishing eventually resumed at full speed

Peruvian biannual anchoveta quotas and catch rates depend on El Niño events, with small events occurring every two or three years and large events occurring every eight to ten years



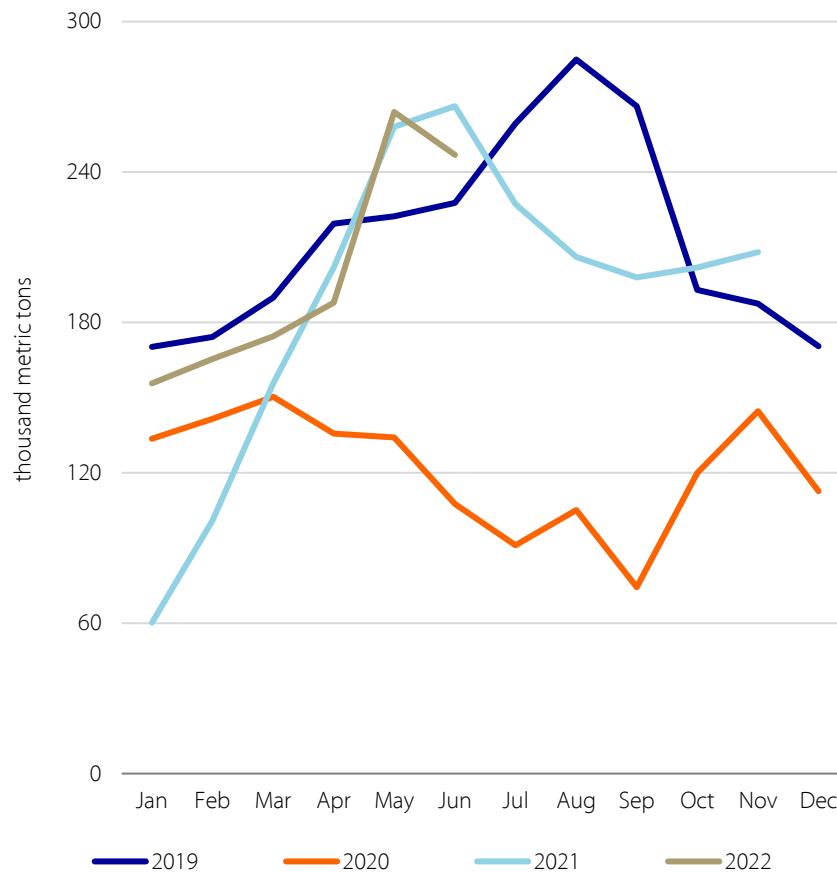
Source: Rabobank 2022

Note: As of July 22, 2022, the expected final catch rate for the Peruvian summer season 2022 is 85%. The actual number at the close of the fishery may be slightly different.

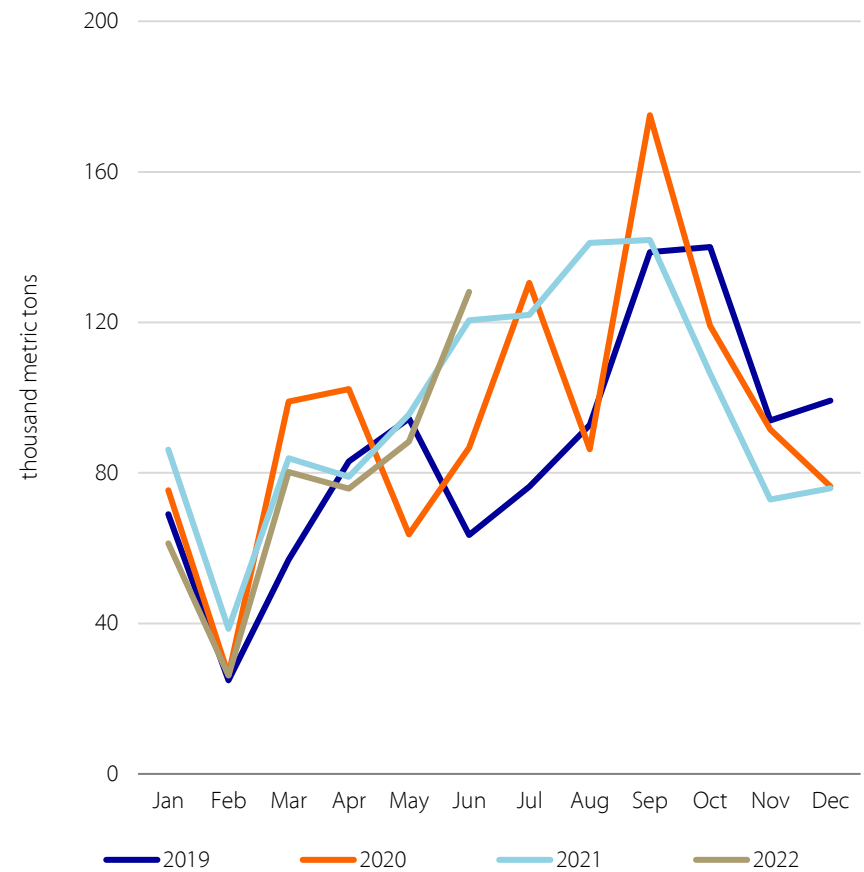
Chinese Fish Meal Stocks Are High for This Part of the Year

Despite good relative fish meal prices, Chinese buyers will not be rushed in 2H 2022

Monthly fish meal stock (end of month), 2019-2022



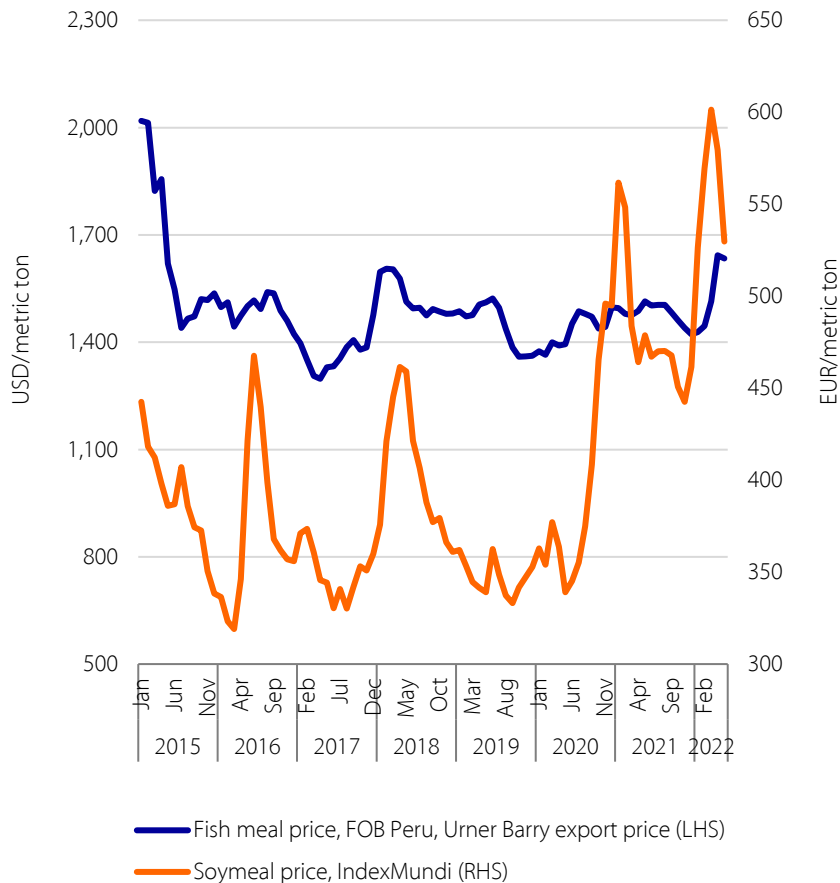
Monthly fish meal sales in China were lower in 1H 2022 than in previous years



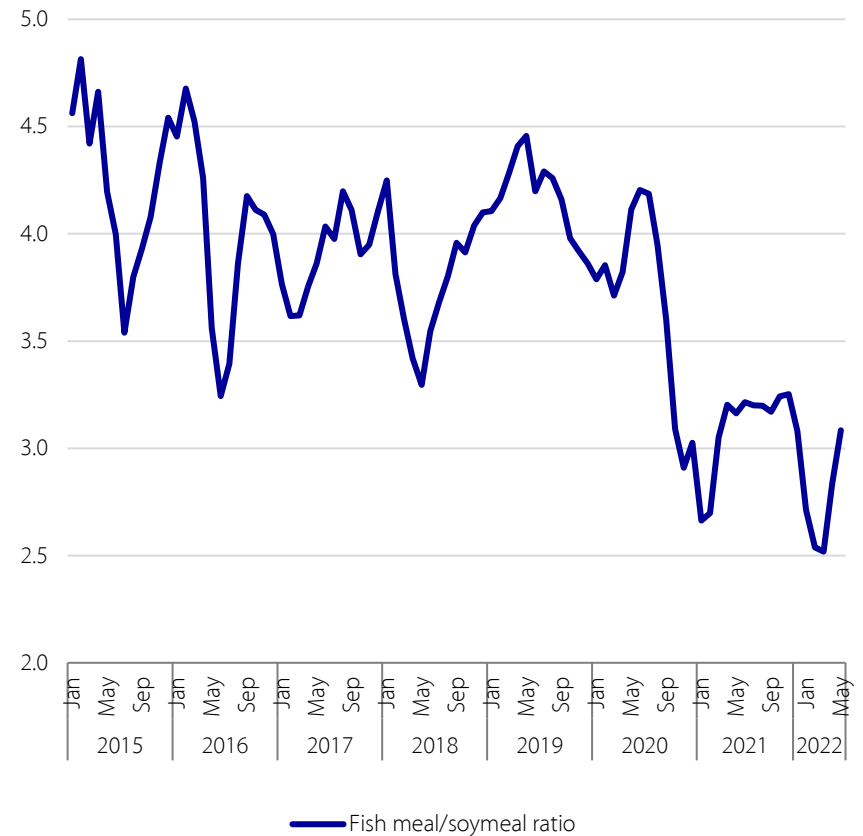
High Soy Prices Continue To Support Fish Meal Prices

Fish meal prices have not responded fully to the sharp price rises of alternatives

Fish meal and soymeal prices, 2015-2022



The fish meal/soymeal price ratio is reaching a new low due to high soymeal prices



An aerial photograph of a salmon aquaculture farm in a fjord. Several large, circular metal cages are floating in the water, arranged in a line. The sun is low on the horizon to the left, creating a bright glow and reflecting on the water. The background shows steep, forested mountains under a clear sky.

4

Aquaculture Outlook for 2H 2022: Key Takeaways

Aquaculture Outlook for 2H 2022: Our Key Takeaways

Salmon

After a record-breaking 1H 2022 marked by high demand and an acute shortage of salmon, the industry will begin to normalize in the second half of the year. Supply in both Norway and Chile will improve. Meanwhile, foodservice demand in the EU and US may be cooling off. Nevertheless, the salmon industry remains in a period of strong demand and relatively weak supply, even if we are well past the price peak.

Shrimp

The shrimp industry has maintained strong supply in a period of falling foodservice demand in the US and EU, resulting in a correction of high prices. It is likely that this supply growth will continue at least in part in 2H. Combined with the high costs of feed, freight, and energy, 2H is likely to be a challenging period for the shrimp farming sector. China's demand remains the most unpredictable factor. It still has considerable upside but is being constrained by lockdowns and import restrictions.

Fish meal

La Niña conditions have allowed for a high quota in Peru for the first season of 2022 (i.e. summer), although it is not likely to be fully caught. Good fishing in the northern hemisphere will mean relatively stable fish meal supply at a global level.

In this market, the high prices of alternative feed proteins such as soymeal are the key price driver. Currently, there is still more upside for fish meal prices.

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