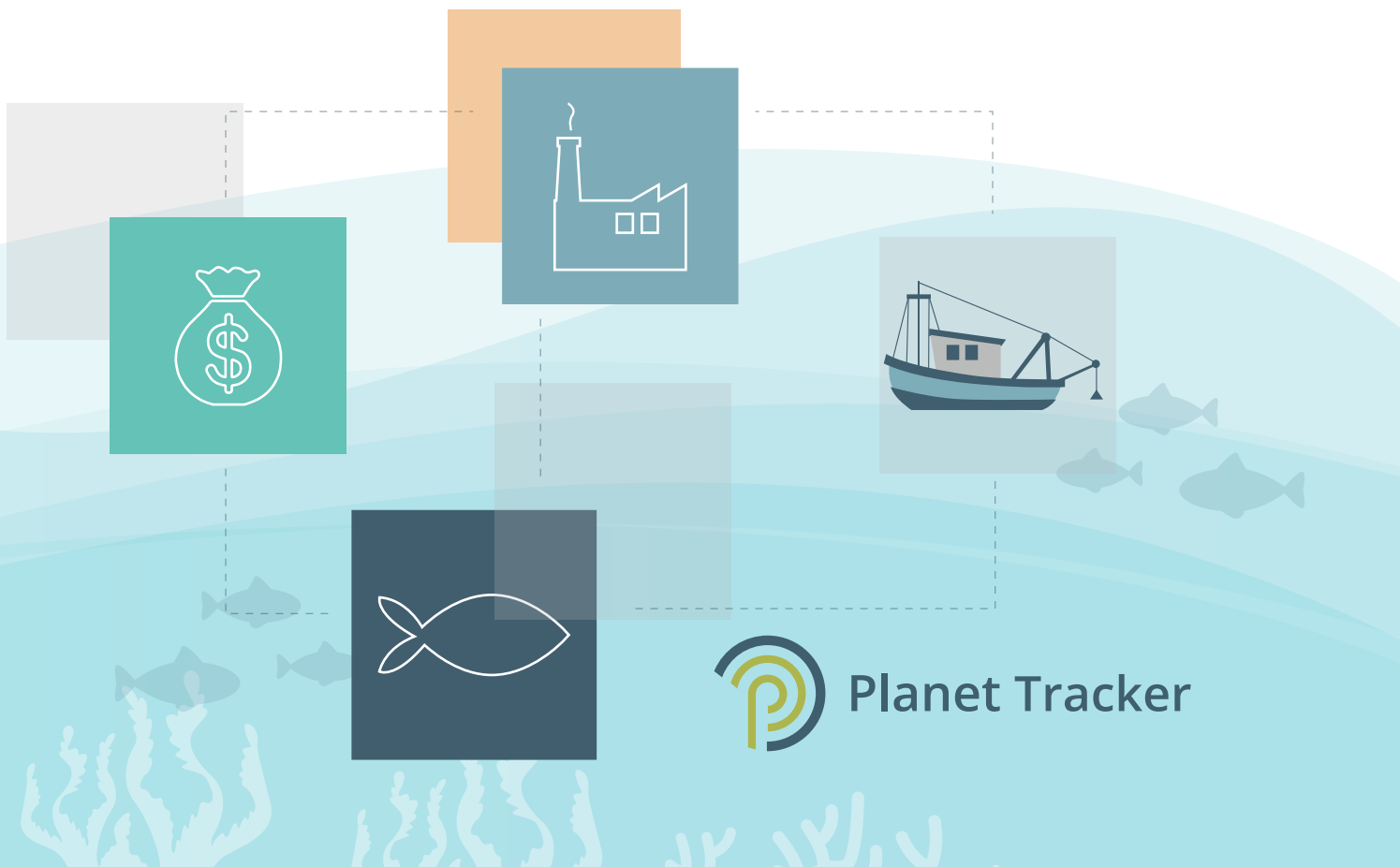


TRACEABLE RETURNS

*Traceability could double the margins of
seafood processing companies and increase
the sustainability of the entire seafood industry*

OCTOBER 2020



ABOUT PLANET TRACKER

Planet Tracker is a non-profit financial think tank aligning capital markets with planetary limits. It was created to investigate the risk of market failure related to environmental limits. This investigation is primarily for the investor community where environmental limits, other than climate change, are poorly understood, even more poorly communicated and not aligned with investor capital.

Planet Tracker generates breakthrough analytics to redefine how financial and environmental data interact with the aim of changing the practices of financial decision makers to help avoid both environmental collapse and financial failure.

SEAFOOD TRACKER

Seafood Tracker investigates the impact that financial institutions can have on sustainable corporate practices through their funding of publicly listed wild-catch and aquaculture companies.

Our aim is to align capital markets with the sustainable management of ocean and coastal marine resources.

This report focuses on seafood processing companies, which handle most of the world's seafood. Effective implementation of traceability solutions in this fragmented and low-margin industry could increase both its profitability and its sustainability.

Seafood Tracker is a part of the wider Planet Tracker Group of Initiatives.

ACKNOWLEDGEMENTS

Authors: François Mosnier, John Willis, Matt McLuckie.

Planet Tracker would like to acknowledge the input of those who reviewed draft papers, including Mark Campanale, Bernd Cordes, Kees Lankester and Tony Long.



GORDON AND BETTY
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FOUNDATION



This report is funded in part by the Gordon and Betty Moore Foundation through the Finance Hub, which was created to advance sustainable finance.



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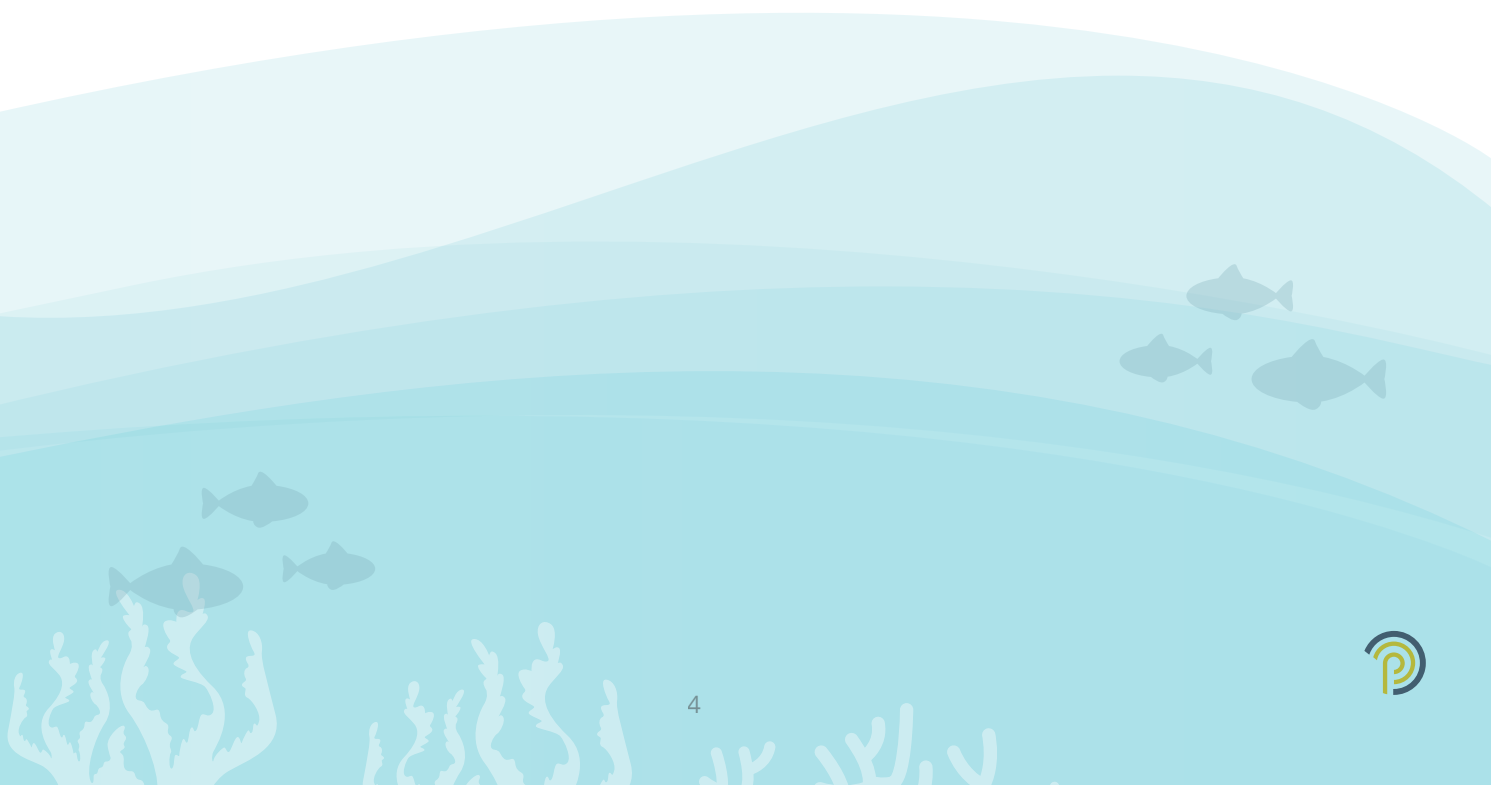
PREFACE

Planet Tracker's research under the Seafood Tracker initiative has so far focused on investigating the financial and environmental stability of the commercial fishing and aquaculture industries, the starting points of the seafood supply chain. In *'Perfect Storm'*, Planet Tracker showed that rebuilding sustainable stocks of wild-catch fish could transform the seafood industry, increase profits, preserve its reputation and reduce financial risk to investors. PT's subsequent Tracker report on aquaculture, *'Loch-ed Profits'*, demonstrated that while salmon production is fast approaching the physical limits permitted by current coastal farming methods, the industry is still some way from moving to more sustainable and cost-effective methods at scale.

In this new Tracker Report, we move one notch down the seafood supply chain to focus on seafood processing companies, positioned half-way between harvesters (wild-catch fishing and aquaculture) and consumers. An under-researched industry, seafood processing is carried out by around 4,000 companies globally, which together handle most of the seafood produced globally. Many of them are also involved at other stages of the supply chain.

THIS REPORT HAS THREE PURPOSES

- 1** It maps out the universe of the seafood processing industry, analysing financials of public and private companies and establishing its key profit pools and sources of growth.
- 2** It also demonstrates how desirable traceability is for the seafood industry and outlines the opportunities of its industry-wide implementation, as well as the challenges to overcome, many of which are found at the processor level.
- 3** Lastly, it shows how seafood processing companies could become significantly more profitable and help increase the sustainability of the entire seafood industry by investing in traceability solutions.



KEY TAKEAWAYS

- Implementing seafood traceability could double the profit margin of fish processors while reducing investors' risks.
- Positioned between the harvesters and consumers, seafood processors that trace their products are pivotal to the process of validating sustainability claims.
- While there are recognised operational challenges, new global standards are overcoming the major issues of lack of interoperability and poor data capture and management.
- A handful of companies have become early traceability adopters, but more widespread implementation is needed and would reduce traceability gaps, to the benefit of the entire supply chain.
- We urge investors to engage with seafood processors to adopt traceability solutions to improve sustainability, profit margins and risk exposure.

EXECUTIVE SUMMARY

Seafood traceability is desirable and profitable

There is a growing gap between those who consume seafood and those who produce it. The number of retailers and consumers who care about the sustainability of their fish is increasing faster than the supply available to them from sources that are certified or rated as sustainable. About 75% of seafood sold today is not certified or rated as sustainable.¹ Sea to plate traceability – the ability to systematically identify seafood products, track their location and reveal any treatments or transformations they undergo – would go a very long way to bridge this gap. In short, traceability does not guarantee sustainability, but claims of sustainability cannot be guaranteed without traceability.

In spite of that, traceability is not yet widely implemented. Is it because traceability is not profitable? Planet Tracker's research shows that this argument just does not hold.

There are recognised obstacles...

Currently, the main obstacles to industry-wide traceability are a lack of interoperability between companies because of system incompatibility, poor data capture and management, and traceability gaps in the supply chain – sometimes caused, for instance, when a whole fish is mixed with others in processing. This lack of interoperability needs to change.

...and a solution is available

In March 2020, the Global Dialogue on Seafood Traceability (GDST) launched a set of traceability standards that at once are open-source, non-proprietary and based on a common digital language - the first and only set standards of its kind.



GDST is an international business to business platform, convened by the World Wildlife Fund (WWF) and the Global Food Traceability Center, and guided by a steering committee that includes thirteen companies and associations across the seafood value chain and across the world. As such, the steering committee and the wider GDST membership very deliberately designed the new standards to be used by all types of companies, from independent fishers using a mobile phone to large integrated seafood companies and large retailers. It protects business-sensitive information while facilitating regulatory compliance.

While the GDST standards leave room for improvement, their near-term industry-wide adoption would seriously reduce the lack of interoperability among companies along the supply chain and encourage better data capture and management. Many large retailers have already pledged to adopt and implement them. Yet among large, listed seafood producers and processors, so far only Thai Union (Thailand) has publicly pledged to do the same.

Seafood processors are key to implementation

Traceability gaps in the supply chain are most pronounced at mixing points, such as when seafood is processed. Therefore, this report seeks to highlight questions of profitability and practicality in the seafood processing industry. These companies convert whole seafood into a variety of other products, such as fresh fish fillets or steaks, or frozen, canned or smoked products. They are instrumental in the pursuit of traceability.

Shining a light on the processors

Positioned half-way between the harvesters of wild-catch fish and aquaculture and the consumers, in long, complex and transnational supply chains, seafood processors handle most of the fish produced worldwide. 89 companies engaged in seafood processing are listed on stock exchanges globally, but beyond that little is known about this USD 140 billion industry. It is dominated by companies based in Japan, Norway, the United States and Thailand, but seafood processing is often only one of a range of business activities for those companies, and their supply chains very often span many countries and time zones. Planet Tracker has outlined the fragmented nature of the seafood processing industry, which comprises more than 4,000 companies globally. Our research reveals that the most fragmented markets, notably Japan and China, are also among the least profitable for seafood processors – see Figure 1.

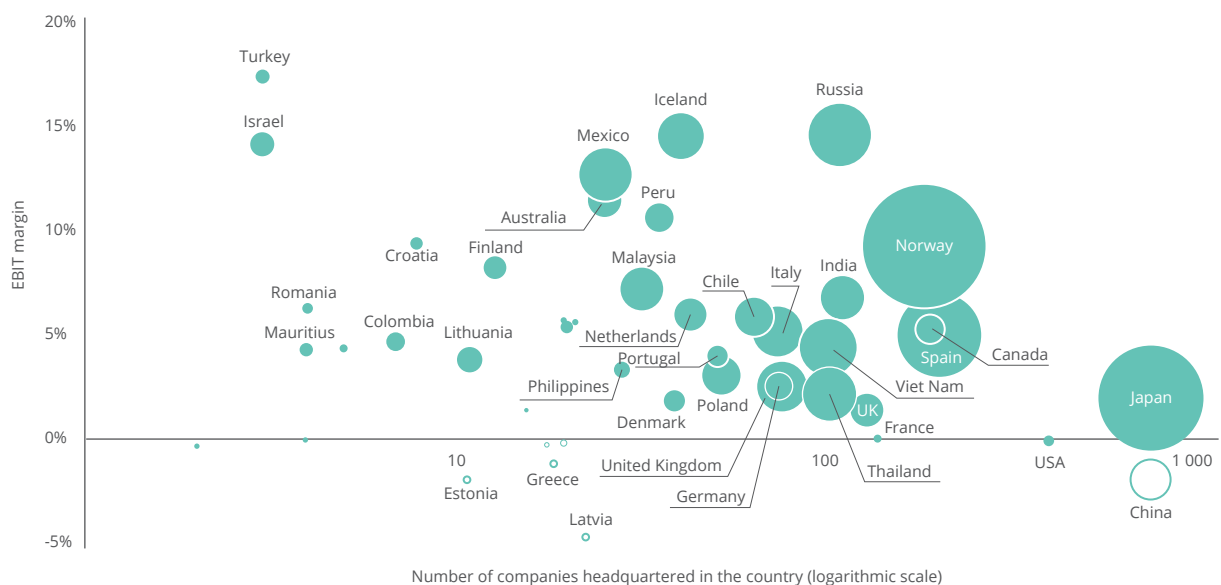


Figure 1: Seafood Processing Companies: EBIT Margin and Number of Companies per Country (size of the bubble proportional to the country's profit pool).²

Note: countries where the estimated EBIT margin is negative (e.g. China) have no infill colour.

Struggling to improve profit margins

For company executives wishing to tackle the low profitability of the seafood processing industry - which records a 3.4% earnings margin before interest and tax (EBIT) on average - several options exist. Among them are:

- Volume growth, but that risks putting further pressure on fish stocks;
- Price inflation, which is challenging in a fiercely competitive industry;
- Lower costs, which are difficult for many of the smaller players if the capital expenditure is significant; and/or
- Consolidation, which is a constant in the seafood industry, explaining two-thirds of 2017-19 revenue growth by Planet Tracker's calculations.

Traceability is an attractive investment

Traceability represents another, viable option. This report demonstrates that traceability is a very compelling way to reduce costs and increase margins for seafood processors. If we analyse the financial position of the typical seafood processor, we can show that implementing a GDST-compliant traceability solution can double the EBIT margins of the typical seafood processor. Fewer product recalls, lower product waste and a decline in legal costs mainly explain that three percentage points (%pts) margin gain.

Comparing traceability to acquisitions

With evidence that traceability is a value-creating investment for seafood processors, we decided to compare it to the important strategic option of acquisitions. Ever present in this fragmented industry - there were 400 transactions in the last decade - mergers and acquisitions (M&A) could become even more enticing, especially for consolidators looking to take advantage of the COVID-19 related challenges faced by some companies. As of June 2020, the combined value of M&A transactions in the seafood industry this year was one of the highest in the past decade. Despite the industry's traditional preference for M&A, Planet Tracker demonstrates that traceability is likely to be a better proposition financially: synergies related to M&A are unlikely to provide a margin uplift for the acquirer of the same magnitude as traceability implementation. If we focus on returns rather than margin development, we calculate that implementing a traceability solution typically yields a five-year internal rate of return (IRR) of 39-62% for the average seafood processing company. This is above the 39% IRR generated on a typical M&A deal in the industry. In addition, and unlike M&A, traceability provides an effective way to reduce risks and raise the sustainability profile of the corporate and the industry - see Figure 2.

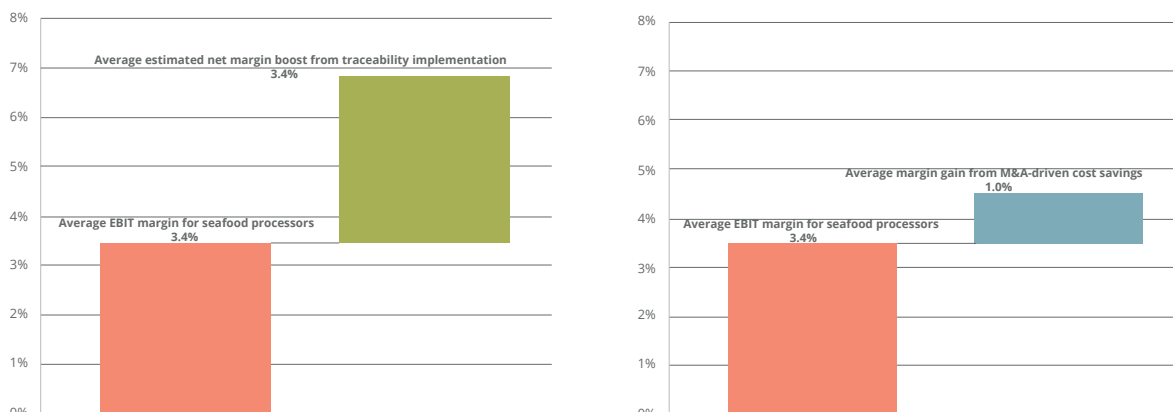


Figure 2: Estimated Average Net Margin Gain from Traceability Implementation Compared to Estimated Average M&A-Driven Margin Gain.³

Note: Assumptions underlying the M&A driven margin gains include: target's revenue at 50% of the acquirer's revenue, target's margin 3%pts lower than the acquirer's and synergies at 6% of acquired sales.

The three main benefits of adopting traceability

The widespread implementation of a GDST-compliant traceability solution offers three main benefits. Firstly, it improves margins and returns, more so than the more glamorous M&A option. Secondly, it gives more credibility to sustainability claims. Finally, it lowers exposure to risks such as illegal, unreported and unregulated (IUU) fishing and food recalls. Given these upsides, it is surprising that listed processing companies do not more readily embrace traceability systems.

We can find only a handful of companies that are actively pursuing this strategy. For instance, among the largest listed companies, only Thai Union has thus far pledged to adopt GDST standards (though other smaller, private companies have, as well).

Traceability opportunities exist for most seafood processors

We have attempted to measure traceability performance across large seafood processors, having built a traceability score based on multiple assessments performed by the World Benchmarking Alliance. Whilst that score has limitations (discussed within), it allows us to identify Thai Union and Mowi as traceability leaders (their traceability score is at least 15 out of 30). Other companies would benefit from additional traceability-related efforts, especially if those efforts are GDST-compliant. Seafood Business for Ocean Stewardship (SeaBOS) could prove to be a good example of how to leverage traceability and corporate structure. SeaBOS is an industry-led, precompetitive platform that includes ten of the world's largest seafood companies and a working collaboration with scientists and NGOs. In 2019, it pledged to work jointly with GDST as both of the organizations developed, with the promise of deploying already existing traceability solutions at greater scale. As just one example, one of its members, Maruha Nichiro, now includes a subsidiary, Austral Fisheries, that has demonstrated the success of supply chain traceability.

AN ENGAGEMENT PROPOSAL

Planet Tracker urges investors in seafood processing companies to discuss with management how traceability could make them more profitable and more sustainable. Discussion could focus on identifying what traceability initiatives are already in place or planned; determining whether these initiatives are or can become GDST-compliant; and debating the financial benefits and costs of implementing GDST-compliant traceability, using a calculator available online.⁴

Many processing companies across the globe have relatively solid balance sheets, making the investment of GDST-compliant traceability solutions financially feasible. This strategy would make these companies more profitable but also help fill in the traceability gaps in the seafood supply chain. Furthermore, both management and investors would be reducing their corporate risk profile.

Essentially, seafood traceability can drive up profitability and increase sustainability.



SEAFOOD PROCESSING

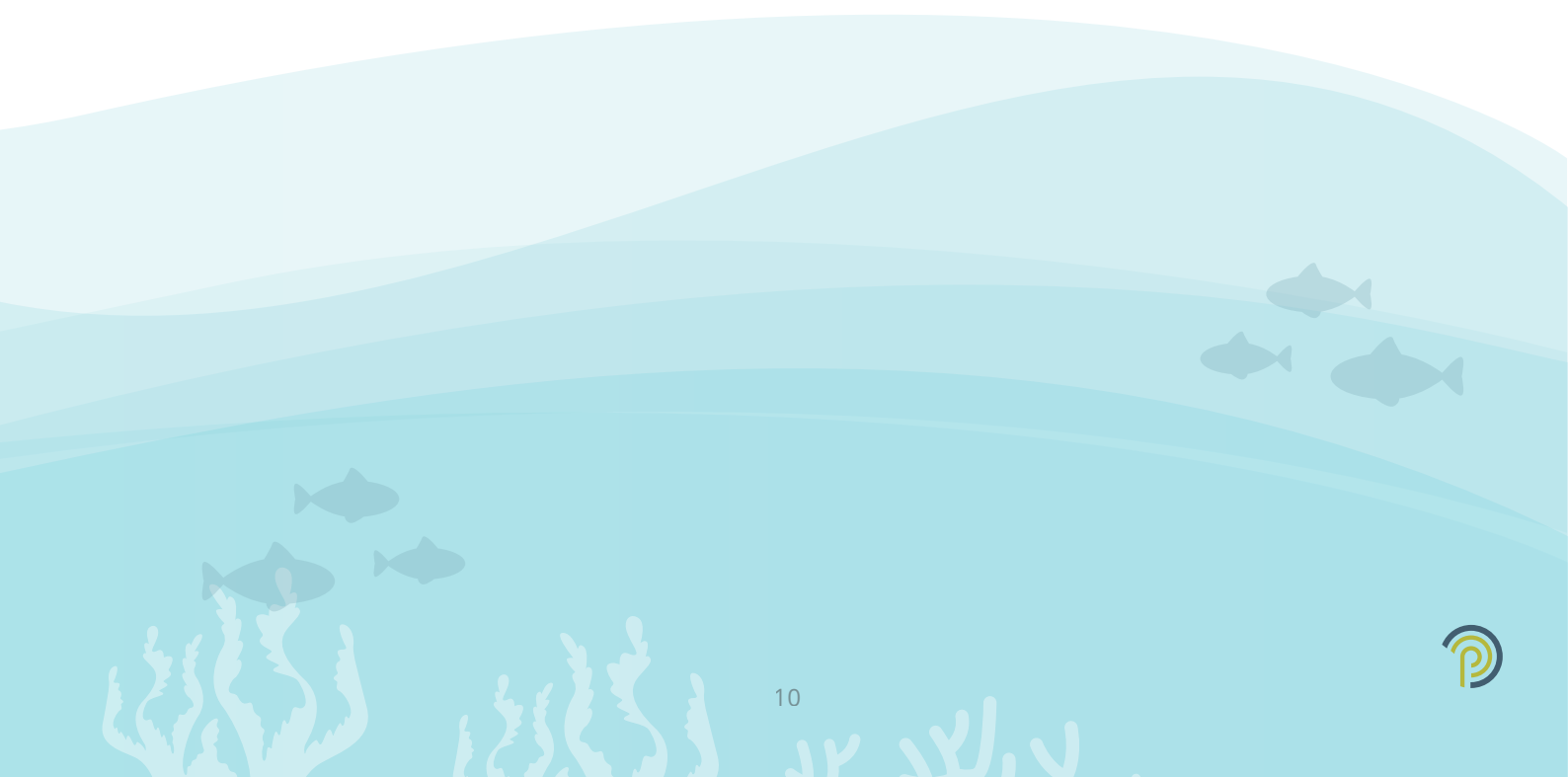
A FRAGMENTED, LOW MARGIN BUSINESS

Positioned half-way between harvesters (wild-catch fish and aquaculture) and consumers in long, complex and transnational supply chains, seafood processors handle most of the fish produced globally. Even though 89 companies engaged in seafood processing are listed, little is known about this USD 140 billion industry since processing is often not the main activity for these companies.

In this report, Planet Tracker shows that the seafood processing industry is low margin (3% on average), fragmented (> 4,000 companies globally), not cash generative and dominated by Japan, Norway, the US and Thailand.

Seafood processing and the seafood supply chain

After seafood products are harvested, they are transported and packed for distribution to processing plants or wholesalers. Seafood processors convert the whole fish or shellfish into other product forms such as fresh fish fillets or steaks, or other items such as frozen products, breaded fish portions and canned or smoked products. Some of these may be further converted by secondary processors to heat-and-serve or ready-to-eat products like seafood salads, ready-made meals or other items. Wholesalers and foodservice distributors receive both raw and processed products and distribute them to retail stores and restaurants⁵ – see Figure 3.



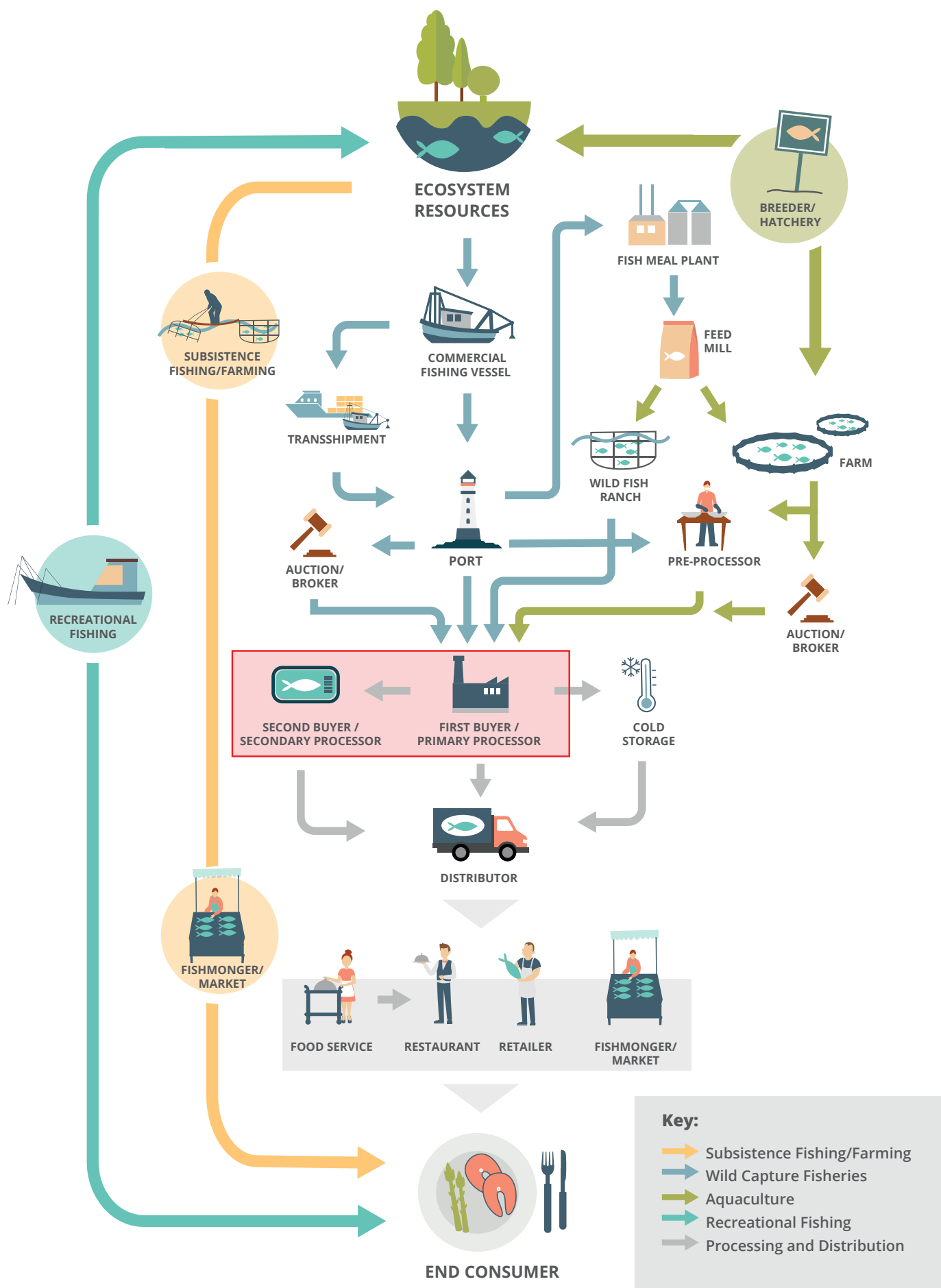


Figure 3: Seafood Processing (highlighted in red) in the Context of the Seafood Supply Chain (source: FishWise).⁶

A fragmented business

Planet Tracker has identified more than 4,600 companies which process seafood globally (see Appendix 1: Methodology).⁷

More than one-third of these companies are headquartered either in China or Japan. Twelve countries have more than a hundred companies - see Figure 4 - accounting for three-quarters of the total number of companies globally. These individual companies are ultimately owned by 4,000 different entities.⁸

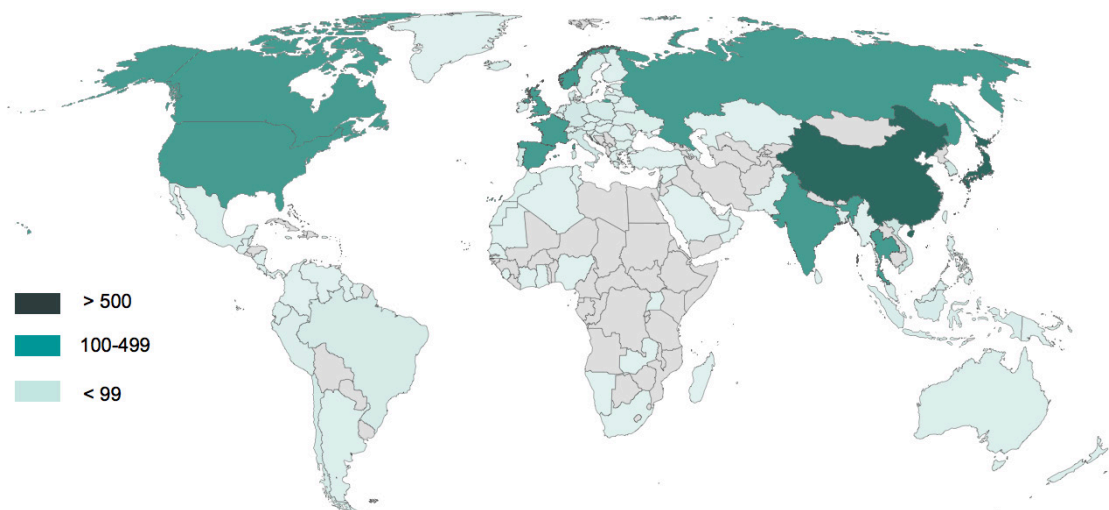


Figure 4: Number of Seafood Processing Companies by Country.⁹

The listed players

There are 218 companies publicly listed on stock exchanges with exposure to seafood production. Out of these, 162 are engaged in activities related to fishing (such as processing or distribution of seafood products).¹⁰

Within that group, 89 companies in the universe identified by Planet Tracker are publicly listed on stock exchanges, of which 47 have a market capitalisation (market cap) above USD 50 million and 13 above USD 1 billion – see Table 1.

Table 1: Companies Engaged in Seafood Processing Listed on Stock Exchanges – Ranked by Descending Market Cap (as of June 1, 2020, market cap > USD 50 mn).¹¹

Company Name	Country	Revenue (USD mn)	P/E	EV/ EBITDA	Market Cap (USD mn)
Mitsubishi Corporation	Japan	135,936	9.7	8.2	35,869
Marubeni Corporation	Japan	62,797	_na	5.5	10,853
Mowi ASA	Norway	4,560	78.5	12.2	10,182
Charoen Pokphand Foods Public Co. Ltd.	Thailand	17,155	10.5	8.2	8,200
SalMar ASA	Norway	1,386	20.4	14.7	5,079
Nomad Foods	UK	2,602	22.9	13.2	5,007

Company Name	Country	Revenue (USD mn)	P/E	EV/ EBITDA	Market Cap (USD mn)
QL Resources Bhd.	Malaysia	888	51.5	26.2	3,777
Leroy Seafood Group ASA	Norway	2,316	18.7	10.8	3,341
Thai Union Group Public Company Limited	Thailand	4,068	16.9	15.7	2,055
Austevoll Seafood ASA	Norway	2,648	24.8	7.8	1,816
Nippon Suisan Kaisha, Ltd.	Japan	6,346	10.1	8.6	1,441
Maruha Nichiro Corp.	Japan	8,318	12.5	12.9	1,139
Century Pacific Food, Inc.	Philippines	783	17.1	11.1	1,048
Grupo Herdez SAB de CV	Mexico	1,165	15.2	8.8	685
Dongwon F & B Co., Ltd.	Republic of Korea	2,598	13.3	8.6	611
Tassal Group Limited	Australia	394	14.8	9.5	558
Yokohama Reito	Japan	1,555	21.2	14.3	509
Marudai Food Co., Ltd.	Japan	2,261	30.1	6.5	459
Zhanjiang Guolian Aquatic Products Co., Ltd.	China	669	_na	_na	457
HaiXin Foods Co., Ltd.	China	199	303.5	39.2	424
Taokaenoi Food & Marketing Public Co. Ltd.	Thailand	170	39.6	28.6	406
Shandong Huifa Foodstuff Co., Ltd.	China	173	666.9	59.4	340
Blumar S.A.	Chile	391	44.6	16.3	339
Kerur Holdings Ltd	Israel	259	14.2	5.6	333
Baiyang Investment Group, Inc.	China	406	_na	17.2	333
Kyokuyo Co., Ltd.	Japan	2,415	13.5	15.8	269
Vinh Hoan Corp	Viet Nam	339	3.2	2.3	263
Hagoromo Foods Corporation	Japan	762	11.2	6.3	253
Floridienne NV	Belgium	459	22.6	11.0	228
Natori Co., Ltd.	Japan	441	19.5	8.4	205
Ichimasa Kamaboko Co., Ltd.	Japan	320	29.9	9.8	169
New Zealand King Salmon Investments Ltd.	New Zealand	116	22.3	_na	168
High Liner Foods Incorporated	Canada	942	20.4	7.6	161
Asian Sea Corp. Public Co. Ltd.	Thailand	264	17.4	13.8	118
CJ Seafood Corporation	Republic of Korea	128	53.3	13.3	115
Pesquera Exalmar S.A.	Peru	266	18.0	6.2	111
Nam Viet Corp.	Viet Nam	193	4.1	4.1	97
Shandong Zhonglu Oceanic Fisheries Co., Ltd.	China	163	8.7	5.6	95
SAJODAERIM Corporation	Republic of Korea	1,140	1.3	10.9	94
Austral Group SAA	Peru	187	12.7	5.4	69
Old Chang Kee Ltd.	Singapore	66	22.0	8.6	60
Dalian Tianbao Green Foods Co., Ltd.	China	155	_na	35.5	59
Empresa Pesquera Eperva S.A.	Chile	321	_na	138.0	58
Sao Ta Foods Joint Stock Company	Viet Nam	160	4.8	3.7	56
Sajo Seafood Co., Ltd.	Republic of Korea	299	_na	11.6	56
Hung Vuong Joint Stock Company	Viet Nam	177	_na	_na	53
Surapon Foods Public Co. Ltd.	Thailand	189	22.2	6.2	50



Not many of these companies disclose their precise exposure to processing, which is often reported with other operations. A small number do, and their exposure can vary considerably. At Maruha Nichiro, for instance, processing accounted for 26% of Fiscal Year (FY) 2019 sales¹² whilst at High Liner Foods, processing is its only activity.

A quartet dominate revenue

Out of the total universe of around 4,600 companies, less than 2,000 companies disclose their revenue. Of those that do, their combined revenue was around USD 136 billion in 2019, although we caution that this number also includes revenue generated from other businesses (e.g. aquaculture, wild-catch or food distribution).¹³ It is difficult to determine the share of revenue related to only seafood processing as most of these companies do not disclose it. We know however that the processed seafood market is estimated at USD 140 billion.¹⁴ This means that the share of revenue of the 4,600 companies (both private and listed companies) engaged in seafood processing related only to processing is likely to be close to USD 140 billion. To put this into context, global seafood production (wild-catch and aquaculture) was valued at USD 401 billion in 2018.¹⁵

Companies headquartered in just four countries (Japan, Norway, the US and Thailand) generate almost half of that total USD 140 billion revenue¹⁶ – see Figure 5.

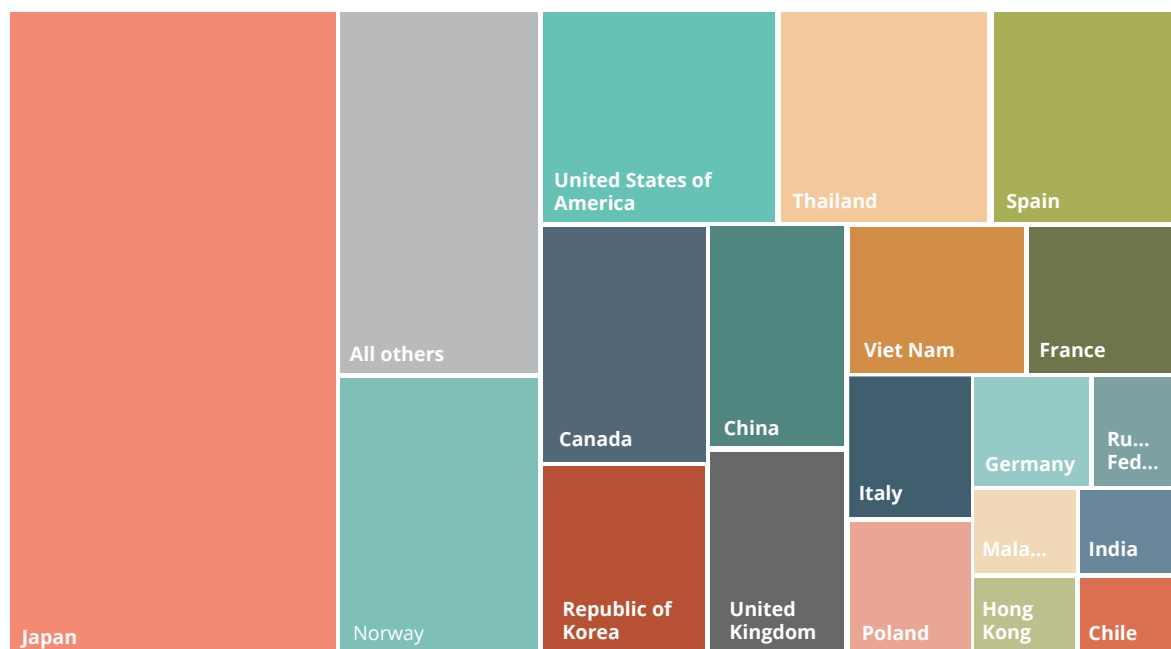


Figure 5: Seafood Processing Companies – Revenue Breakdown by Location of Company's Headquarters.¹⁷

The USD 5 billion profit pool where China and the US struggle

Using only companies that disclose EBIT (around 1,300), we calculate that the average EBIT margin in the industry is 3.4% (4.5% if adding in depreciation and amortisation to compute the EBITDA margin). This means that the global seafood processing profit pool is an estimated USD 5 billion, of which half is generated in Norway, Japan, Spain, Russia, Viet Nam and Thailand.¹⁸

As shown below, the most fragmented markets (Japan, China, the US) are also among the least profitable. Conversely, above average margins are generated in multiple, small but concentrated profit pools such as Mexico, Iceland, Finland and Israel.¹⁹ Statistically, there does not seem to be any correlation between profitability and the number of players – see Figure 6.

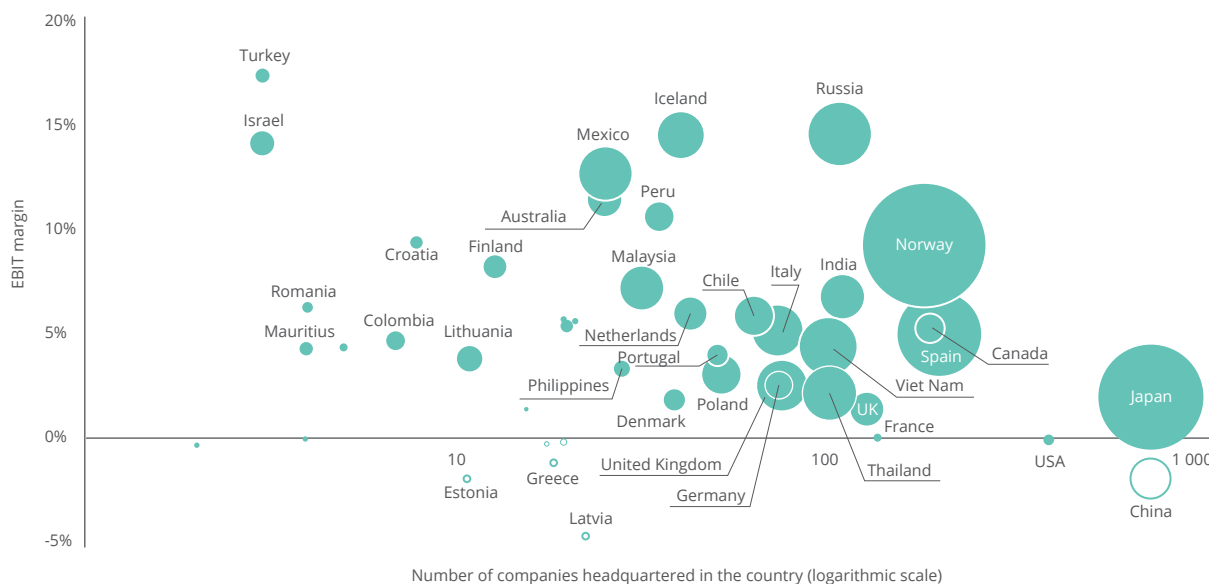


Figure 6: Seafood Processing Companies: EBIT Margin and Number of Companies per Country (size of the bubble is proportional to the country's profit pool).²⁰

Note: countries where the estimated EBIT margin is negative (e.g. China) have no infill colour.

Low cash generation, significant investment and limited leverage

Capital expenditure (capex) accounts for 4.5% of sales on average in the seafood processing market, implying that companies across the globe are actively investing in property, plant and equipment at a total of around USD 6 billion every year.²¹ Countries with a strong aquaculture industry such as Norway, Peru, Chile or Australia have high capex to sales ratios. Depreciation and amortisation average 1.1% of sales for processors, less than one-third of the capex-to-sales ratio, meaning that companies are actively investing in future growth – see Figure 7.

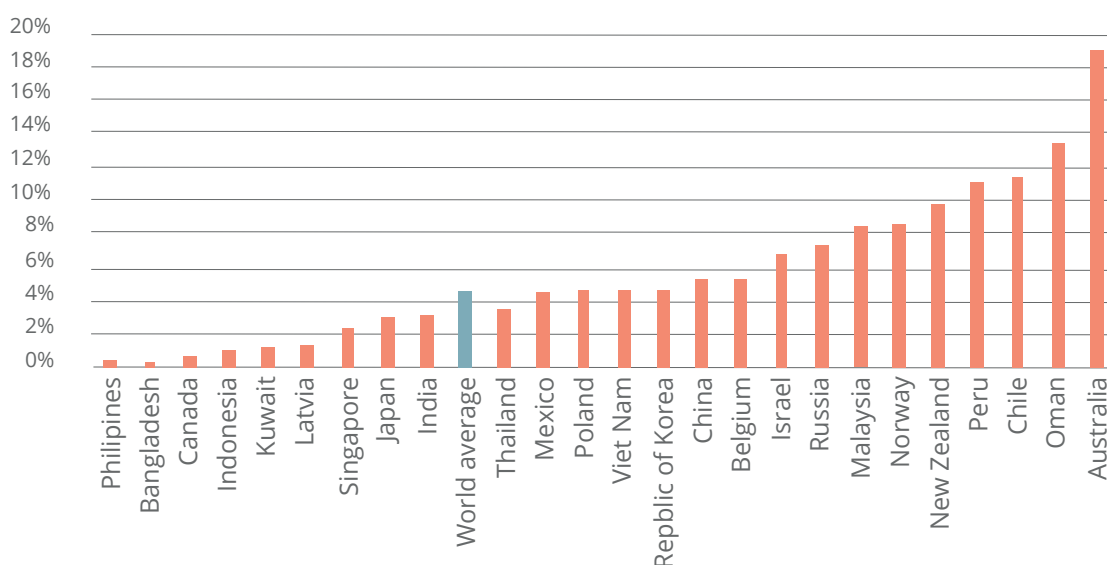
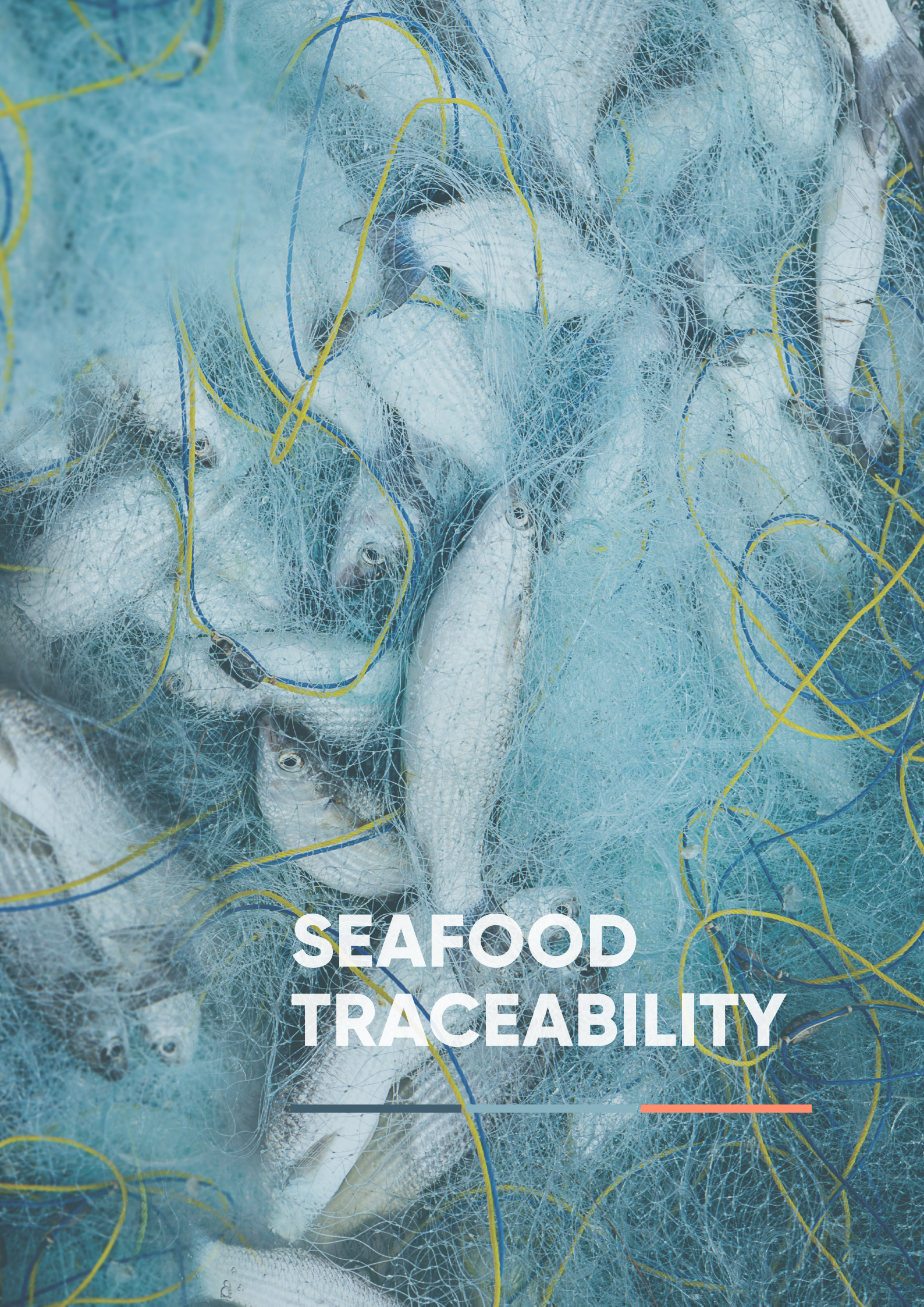


Figure 7: Seafood Processing Companies: Average Capex to Sales Ratio by Country.²²

Globally, seafood processing companies did not generate free cash flow in 2019, essentially meaning that all of the operational cash flow in the industry was re-invested. In the larger markets, only Thailand, Mexico, Poland, Viet Nam, Russia, Japan and India had a positive free cash flow in 2019.²³

Probably as a result of the low cash generation, most seafood processing companies are not leveraged: net debt/EBITDA ratios average zero (the median ratio is -0.5x) across the industry, although the combined EBITDA-weighted average is 1.5x since the largest companies (especially the Japanese ones) have higher leverage ratios.²⁴



SEAFOOD TRACEABILITY

DESIRABLE BUT UNDEREMPLOYED

This section addresses why sea to plate traceability – the ability to systematically identify a seafood product, track its location and describe any treatments or transformations it undergoes at all stages of the supply chain – is paradoxically both highly desirable for seafood processors and yet rarely implemented.

Traceability, especially if industry-wide and sea to plate, would allow seafood companies to simultaneously validate sustainability claims and satisfy demand for sustainable seafood while avoiding exposure to illegal, unreported and unregulated fishing and would significantly reduce product recalls.

However, traceability gaps in the supply chain (especially at processors), a lack of interoperability between various companies due to incompatible systems, and poor data capture and management, make this currently difficult.

This could change soon, thanks to the March 2020 release of the GDST (Global Dialogue on Seafood Traceability) standards. Open-source and non-proprietary, this ‘common language’ is designed to be used by all kinds of companies, from independent fishers using a mobile phone to large integrated seafood companies and large retailers.

Because the industry-wide adoption of GDST standards would greatly advance sea to plate traceability, multiple large retailers across the world have already pledged to adopt and implement them. Yet among large, listed seafood companies, so far only Thai Union has pledged to do the same.

THE DESIRABILITY OF TRACEABILITY

Definition

Traceability is about capturing and sharing data that provides transparency and builds trust. Whilst several definitions of traceability exist, we use the following: the ability to systematically identify a unit of production, track its location and describe any treatments or transformations at all stages of production, processing and distribution.²⁵

Types of traceability

Internal traceability is a form of traceability that enables a company to follow a product through its system after receipt from the supplier. External traceability allows for connectivity with immediate supply chain partners. For instance, a processor that can trace its fish from purchase to sale will have implemented internal traceability. If its product can also be traced beyond company ownership – e.g. transportation and distribution beyond its factory gates – then this would be external traceability.

Records may be kept in one of the three following ways:

- Paper-based: manual paper-based records;
- Basic electronic: computerised record-keeping;
- Integrated hardware: use of bar codes and readers, RFID tags and scanners.

Integrated hardware is the best, most reliable type of traceability, especially if the underlying data collection and processing systems are interoperable, meaning that different information technology systems and software applications can communicate and use that information.

Implementing traceability

The global seafood industry faces an especially difficult traceability challenge given its long and complex supply chain, particularly from the point of capture to the first stage processor. Yet a misconception often exists in the sector that traceability is not fundamental to business performance.²⁶

In the past, the industry's traceability focus was primarily on food safety concerns. The increase in media coverage about the environmental, social and legal issues associated with seafood production has led to shareholder concerns, a potential impact on brand value and challenges to the corporate sustainability initiatives of companies.

Costly recall reduction

In the food industry, recalls are particularly costly, with the average cost estimated at USD 10 million in 2012. Many companies incur over USD 100 million in direct costs per recall.²⁷

For instance, listed seafood processor High Liner Foods recognised USD 13.5 million in net losses in 2017 (equivalent to 1% of sales) following a voluntary recall of certain brands of breaded fish and seafood products sold in Canada and the U.S. The fear was that the fish may have contained a milk allergen that was not declared on the packaging.²⁸

Traceability systems, and especially integrated solutions, can reduce the direct costs of recalls by 90% for short shelf life products and by 95% for longer shelf life products.²⁹



IUU fishing and fish fraud

Illegal, unreported and unregulated (IUU) fishing is estimated to account for 15% to 30% of global catches – more in some ocean basins like the Northwest Pacific.³⁰ IUU often occurs in areas already overfished and is a recognised enabler of human rights abuses, narcotics trade, terrorism and other illicit activities.

In addition, around one-third of seafood globally is mislabelled.³¹ Determining product origin can be difficult since many fish are caught far offshore and, once processed, similar seafood species can be difficult to differentiate without traceability data. For instance, a 2018 study found that as much as 28% of the fish sold as wild salmon in New York State supermarkets was mislabelled and that proportion was 88% for lemon sole.³²

Without traceability solutions, seafood processing companies are unable to demonstrate to their customers or investors or lenders that they have reduced exposure to IUU risk or fraud.

Sustainability claims and certification in the seafood market

In Northern Europe and North America, companies across the supply chain began making commitments to sustainable seafood in the early 2000s, and such commitments have expanded globally over time.³³ The concept was to harness consumer demand to create economic incentives for well-managed fisheries and aquaculture. By differentiating otherwise homogeneous products with an eco-label, the aim was to yield a price premium for the labelled product.

There is ample evidence that consumers prefer and are willing to pay more for sustainable seafood in several countries' markets.³⁴ As a result, NGOs and other proponents of sustainability in seafood started to target retailers because they have the market leverage to pressure their suppliers into adopting more sustainable practices.³⁵

The result was that retail-led demand for sustainable seafood far exceeded the supply, leading to a proliferation of standards, certification and ratings programmes - see Table 2.

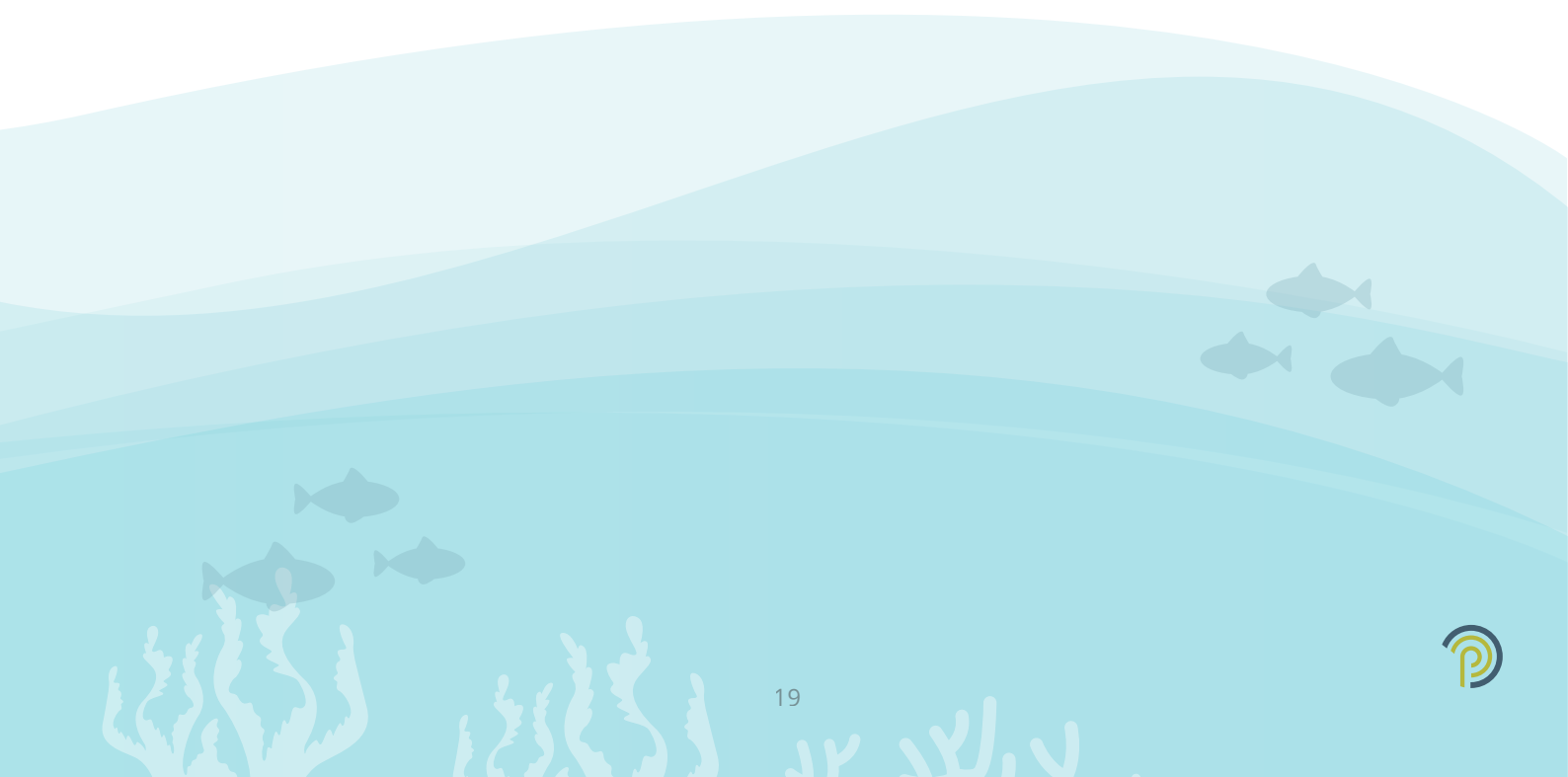


Table 2: Sustainability Commitments Made by Food Retailers in the UK and US.³⁶

Country	Name	Year	External standards
UK	Tesco	2014	MSC, MCS, SFP, SSC, IFFO
	Sainsbury's	2011	MSC, MCS, SSC, ASC
	Asda	2011	MSC, SFP
	Morrisons	2014	MSC, MCS, SSC Global GAP aquaculture
	Co-op Food	2007	MSC, MCS
	Aldi UK	2012	SFP, MCS, MSC
	Waitrose	2013	MSC
	Lidl	2006	MSC
	Marks and Spencer	2010	MSC, FIP
USA	Walmart	2006	MSC, FIP, BAP, AIP
	Kroger	2009	MSC, FIP, BAP
	Safeway	2009	MBA
	Publix	N/A	FIP, MSC, Global GAP, ASC
	Target	2011	MBA
	Whole Foods	1999	MSC, MBA
	Trader Joe's	2010	MBA
	Aldi US	2010	FIP, AIP
	Hy-Vee	2014	MBA, Friends of the Earth
	Wegmans	2011	MSC, FIP, GAA

Note: AIP: Aquaculture Improvement Project; ASC: Aquaculture Stewardship Council; BAP: Best Aquaculture Practices; FIP: Fisheries Improvement Project; GAA: Global Aquaculture Alliance; Global GAP: Global good aquaculture practices; IFFO: International Fishmeal and Fish Oil Organization; ISSF: International Seafood Sustainability Foundation; MBA: Monterey Bay Aquarium Seafood Watch; MCS: Marine Conservation Society UK; MSC: Marine Stewardship Council; SFP: Sustainable Fisheries Partnership; SSC: Sustainable Seafood Coalition UK; WWF: World Wildlife Fund.

More than 30 seafood guides and certification programmes have since been developed by NGOs, in addition to multiple government-led certification schemes and dozens of community-supported fisheries initiatives that adopt more sustainable practices.³⁷

Faced with a crowded landscape of labels, consumers have started to feel the need to verify the sustainability claims made by companies across the supply chain. For instance, in a 2018 survey across 22 countries:³⁸

- 🐟 70% of seafood consumers would like to know more about the sustainability of companies' fish and seafood products.
- 🐟 72% said there is a need for brands and supermarkets to independently verify their claims about sustainability (up from 68% in 2016).

For many seafood companies, providing the means to justify sustainability claims has evolved from a marketing tool into a near-necessity. However, it has not been proven that retail-level price premia are transmitted back through the supply chain to create an incentive for more sustainable management of natural capital.³⁹ The prospect of yielding price premia through the sale of sustainable products has therefore become elusive for seafood processors. Against this backdrop, traceability – a necessary condition for sustainability claims to be justified – is often perceived as a costly necessity, rather than an opportunity.

OBSTACLES TO INDUSTRY-WIDE TRACEABILITY

Achieving industry-wide traceability requires engagement and collaboration among all parties along the entire supply chain. The main obstacles to reach this outcome include:⁴⁰

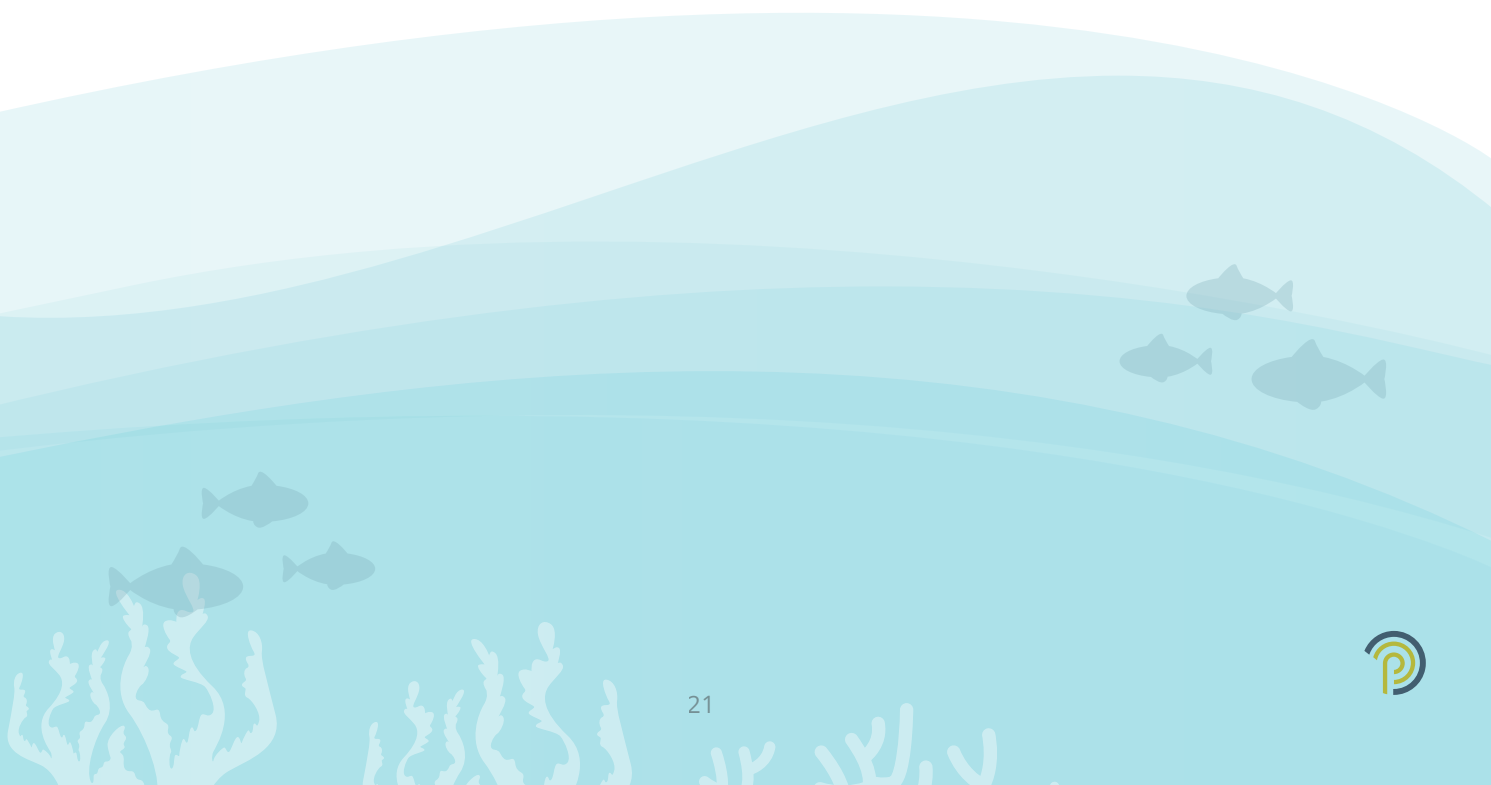
- ✎ **Gaps in the supply chain:** Companies ahead of the curve on traceability often run into issues trying to convince their business partners at other stages of the supply chain to collect the data they need. In addition, traceability at mixing points, like processing, auctions and trans-shipment points, is hard to achieve, especially in developing markets.
- ✎ **Inconsistent industry data standards:** Multiple ways to document seafood traceability and countless individual systems have been developed. Rarely, though, can those systems seamlessly interact with each other or share data.⁴¹
- ✎ **Poor data capture and management:** Current seafood practices are outdated, with much recording performed manually on paper, which is extremely inefficient, prone to error, unsecure and forgeable. Low-cost, user-friendly technologies are needed for both small- and large-scale operations to make the business case to upgrade from paper to computers, including costs of equipment and training.

GDST: A SOLUTION?

The Global Dialogue on Seafood Traceability

A major step towards industry-wide traceability was taken on March 16, 2020, when global standards for seafood traceability were released. Developed by the Global Dialogue on Seafood Traceability (GDST) after three years of discussions convened by WWF and the Global Food Traceability Center at the Institute of Food Technologists, a global research institute based in Chicago, the standards are open-source and non-proprietary, enabling all kinds of companies to use them, from fishers using a mobile phone to large integrated seafood companies.⁴²

Planet Tracker recognises that there are limitations to the GDST standards (see below), but believes that as the first globally-applicable standards on seafood traceability, they have the potential to significantly improve the efficiency, reliability and affordability of traceability implementation in the seafood industry.



GDST overview

- ✎ The standards describe the key data elements that should be linked to seafood products as they move through the supply chain, and the exact way that data should be presented in order to permit easy sharing (e.g. there are many different ways to list a port code; which one should be used?). The standards also indicate possible verifiable data sources, such as a vessel's licensing authority.
- ✎ The standards were designed to reflect the GS1 EPCIS, an existing international traceability standard used by major retailers, brands and supply chains (not only for food products).⁴³ GDST's Framework 1.0 allows companies to integrate with GS1-based systems without making commitments to use proprietary GS1 traceability solution products.
- ✎ It provides companies with visibility into their supply chains as well as a way of maintaining data access controls to protect business-sensitive information. The standards are also adapted to facilitate regulatory compliance with import controls (e.g. the US Seafood Import Monitoring Program and the European Union's anti-IUU Regulation).⁴⁴
- ✎ The standards and the accompanying documentation are available in English, Chinese and Japanese.⁴⁵

Further work is necessary

GDST's 1.0 standards are only in their first iteration; more work will inevitably be undertaken on how to verify that the claims made in the data are genuine. An accreditation of traceability providers could be a possible way forward.

While GDST recognises that digital supply chains are the future of the seafood industry, digitisation remains a challenge, especially for smaller players in developing countries where paper-based systems still are widely used (albeit facing increasing competitive disadvantages). As a result, GDST does not require complete digitisation of internal company operations, but only focuses on digital data transfer between supply-chain partners.⁴⁶



Case study: Blockchain and traceability

In order to address issues related to the lack of traceability, data platforms using blockchain technology to securely and efficiently collect, share and analyse vast quantities of data have been developed in recent years:

- ✎ Norwegian IT company Atea has for instance partnered with IBM to develop a blockchain-based solution specifically targeted to aquaculture companies, which creates a permanent record of every entry made into its ledger. By distributing the record-keeping functions of the ledger across several organizations, no one has complete control over the data. This ensures the platform can be trusted and means that regulators can issue licenses or record the results of inspections on the blockchain ledger. Farm operators can use the same networks to record data about their fish. They can also upload video, images, recipes, etc, enhancing consumer trust and strengthening their connection to the producer. This information can be shared across the entire supply chain.⁴⁷
- ✎ In 2019, having partnered with SAP, Bumble Bee Foods launched for its yellowfin tuna a blockchain technology that provides instant information about the fish-to-market journey (size of the catch, point of capture, the fishing community that caught it, authenticity, freshness, safety, fair trade fishing certification and sustainability). Because it relies on blockchain, the technology creates a secure supply chain history, which can be shared and seen by each participant.⁴⁸

While the blockchain technology allows for more secure data storage and sharing, it does not improve the underlying quality of the data collected, nor does it prevent fraudulent data from entering the ledgers at the source.

GDST 1.0 standards need to be implemented by large seafood companies to be effective

Besides a few retailers like Sainsbury's and Whole Foods and a few seafood associations, only a handful of large seafood companies have joined the GDST 1.0 Adoption Statement, in which they pledge to "work to adopt and implement these standards over time".⁴⁹ Those that have include:

- ✎ Thai Union, one of the largest seafood companies globally.
- ✎ The Fishin' Company, the largest importer of tilapia in the world.
- ✎ Labeyrie Fine Foods, a producer of foie gras, smoked salmon and other fish and meat-derived products, mostly sold in France.
- ✎ Orca Bay, a wholesaler of frozen fish based in Seattle, USA, in which Maruha Nichiro owns a minority interest but which is majority-owned by Japanese conglomerate Tokusui.
- ✎ New England Seafood, a processor and wholesaler of seafood based in the UK.

Joining the adoption statement does not commit a company to any specific action or timeline for implementing the GDST standards. It is simply intended as a public statement that GDST 1.0 should be accepted as the new global industry standard for seafood traceability.⁵⁰

A growing number of endorsers

The Global Tuna Alliance (an independent group of retailers and tuna supply chain companies),⁵¹ the International Pole and Line Foundation (a foundation that works to support handline tuna fisheries across the world),⁵² the UK Seafood Industry Alliance,⁵³ and Sea Pact (representing ten seafood companies from North America) have all recently endorsed the GDST Framework,⁵⁴ often citing interoperability and verifiability as the main reasons.

In addition, the Seafood Business for Ocean Stewardship (SeaBOS, an organisation that represents ten of the largest seafood companies in the world^a) also signed an MoU with GDST to explore adoption of global industry standards.⁵⁵ Thus far, however, only one of its members, Thai Union, has signed the GDST 1.0 Adoption Statement.

^a The members of SeaBOS are: Maruha Nichiro, Nissui, Thai Union, Dongwon, Mowi, Cermaq (subsidiary of Mitsubishi Corporation), Skretting (subsidiary of Nutreco), Cargill Aqua Nutrition, Kyokuyo and Charoen Pokphand Food

RETURNS FROM TRACEABILITY IMPLEMENTATION

Planet Tracker demonstrates in this section that traceability is a very compelling investment for seafood processors, the key finding of this report and something that has not been detailed before.

Through a thorough mapping of the multiple costs (relatively easy to calculate) and benefits (more challenging) of traceability implementation, we attempt to solve the paradox of traceability in the seafood industry outlined in the previous chapter.

Having drawn the financial portrait of the average seafood processor, we then demonstrate that implementing a GDST-compliant traceability solution can double the EBIT margins of the typical seafood processor, which are currently at a low 3%. Lower recall, product waste and legal costs mainly explain that 3 percentage points (%pts) potential margin gain.

The benefits of traceability

One of the key obstacles to wider implementation of traceability systems is the belief that its benefits are difficult to assess accurately. Below we present a list of the key benefits of traceability, along with a method to calculate their impact, as outlined by Future of Fish.⁵⁶

Whilst some of these benefits might not materialise (e.g. the story premium), many of them can be material. For instance, food losses and food waste in global seafood supply chains are estimated at 35% and traceability is a key way to reduce them⁵⁷ - see Table 3.

Table 3: Benefits of Traceability for Seafood Processing Companies, including Calculation Method for those Benefits.⁵⁸

Category	Factor	Description	Calculation Method	Main beneficiaries
Efficiency & Quality	Reduction in Product Waste	A core benefit of traceability systems, resulting from reduction in lost inventory, faster inventory turns, first-in/first-out process adherence, and decreased shrink	% waste avoided (relative to total product) times % applicable product	- Everyone in the seafood supply chain - Fish stocks - General environment
	Reduction in Packaging Waste	Beyond product costs, traceability may help track and better manage packaging waste	% waste avoided times % applicable packaging	- Everyone in the supply chain downstream from processors (included) - General environment
Pricing	Certification Premium	Traceability may contribute to achieve new certifications that yield a price premium	% premium times % certified product	- Retailers (mostly) - Seafood processors (potentially)
	Story Premium	Traceability allows to market “storied fish” for a premium price with end consumers (or avoid discount for opaque origin)	% premium times % storied product	- Retailers - Seafood processors (potentially)
	Pricing Optimisation	Traceability allows for more accurate cost-based pricing	Avg. % increase	Everyone in the supply chain downstream from processors (included)
Trade	Increased Sales Volume	Traceability may help attract additional buyers looking for traceable, verifiable products	% volume increase	Seafood processors
	Lower Recall Costs	Being able to locate products allows for faster and more efficient response in the case of a product recall	% reduction times Average recall costs (annual)	Everyone in the supply chain downstream from seafood processors (included)
	Reduction in Insurance Premiums and Claims	Having proof of origin and more robust product data can unlock lower premiums from general liability insurers	% reduction times Current premium costs (annual)	Seafood processors
	Reduction in Credits	Clients may ask for credits due to discrepancy in order weight and items - traceability can provide a verifiable source to dispute false claims	% reduction times Current credits (annual)	Seafood processors

Category	Factor	Description	Calculation Method	Main beneficiaries
Staffing	Headcount Reduction - Data	Traceability greatly reduces the effort required to collect and process data and reporting (e.g. during audits), and may allow to remove or redeploy these staff	# FTE times Avg. Salary	Seafood processors
	Headcount Reduction - Operations	Traceability can optimise workflow on the floor, yielding a more efficient operation, and potential labour savings	# FTE times Avg. Salary	Seafood processors

The three key conditions to justify a financial investment in traceability

Regardless of their size, location or products, most seafood processing companies mention the difficulty they have in justifying investment in traceability because its outcomes and benefits are more difficult to grasp than, say, additional investment in capacity.⁵⁹

Research showed that three conditions typically precede an investment in traceability:⁶⁰

- **Explicit support of owners and/or senior management** who have direct accountability for the company's success. A key driving factor of this support is whether these individuals are aware of an incident (e.g. product recall) in which traceability would have resulted in a distinct benefit.
- **Investment in a wider operating platform or information system**, rather than “just” in traceability.
- **Market pressures:** grocery retailers usually exert more pressure on their suppliers to implement traceability systems than do food service operators (e.g. restaurants). This is because in retail, a clearer link can be established between traceability and the factors influencing consumer choice whilst in food service, consumer purchasing decisions are influenced by multiple factors less related to the product itself such as restaurant ambiance, story behind the food and overall eating experience.

Costs of traceability

Contrary to its benefits, the costs of traceability are much easier to list and compute - see Table 4.

Table 4: Costs and Methodology for Traceability.⁶¹

Category	Factor	Description	Calculation Method
Hardware	Servers	A traceability system may require one or more onsite computers to serve the application	Unit cost
	Network	New WiFi routers, and/or wiring to support the system may be required	Unit cost
	Terminals	Most traceability systems require terminals (monitor, keyboard, stand, etc.) to enter data	Unit cost
	Scales	Electronic scales to weigh product	Unit cost
	Scanners	Bar code scanners to track flow of product, typically included on terminals	Unit cost
	Other	Any other peripheral devices or hardware required by the system (e.g. iPad/tablet, RFID reader, etc.)	Unit cost
Software	Activation Fee	One-time software fee charged on setup of the traceability system	Vendor quote
	Annual License Fee	Annual fees for usage of the traceability system - these may be charged per user, per seat, or as a flat annual fee	Vendor quote
Contractors	Onsite Implementation	Fees charged during configuration and customization of the traceability system	Days per Year x Day Rate
	Full Chain Integration	Additional configuration or customization fees charged to integrate the system with buyer and/or supplier systems	Days per Year x Day Rate
	Training	Costs of external trainers to help staff learn the traceability system and new business practices	Days per Year x Day Rate
	Support & Maintenance	Fees charged by external consultants to fix and/or maintain the traceability system	Days per Year x Day Rate
Trade	Supplier Premium	Committing to traceability and transparency may require a switch to different suppliers for some products (e.g. for proof of origin) with higher costs	% Premium x % Eligible Product
Staffing	New FTE	New staff for value-added functions like data analysis, or traceability marketing ("storied fish") may be hired	# FTE x Avg. Annual Salary

Computing the returns on an investment in traceability

By analysing the costs and benefits, we determine the returns on investment (ROI) of traceability implementation for the average seafood processing company.

Bringing together some of the diverse metrics previously analysed in the first section, we can indeed paint a picture of the average seafood processing company. From a financial perspective, such a company could look as follows – see Table 5.

Table 5: Financial Snapshot of the Average Seafood Processing Company.⁶²

Item	Value (USD mn)	% of sales	Related Valuation Ratio	Comment
Revenue	76.3	100%	EV/Sales: 0.7 x	based on average revenue per company in the sector; EV/Sales derived from EV
Employee number	227	n/a	Revenue per employee: USD 335k	based on average revenue per employee in the sector
EBITDA	3.4	4.5%	EV/EBITDA: 15.7 x	based on average EBITDA margin in the sector and average EV/EBITDA ratio
EBIT	2.6	3.4%	EV/EBIT: 20.4 x	based on average EBIT margin in the sector; EV/EBIT derived from EV
Net income	1.6	2.1%	P/E: 37.8 x	derived from average P/E ratio in the sector and from market cap
Operating cash flow	3.3	4.4%		derived from capex and FCF
Capex	(3.4)	(4.5%)		based on average capex/sales ratio in the sector
FCF	(0.1)	(0.2%)		based on average FCF/sales ratio in the sector
Net debt	5.0		Net debt /EBITDA: 1.5 x	based on average net debt/EBITDA in the sector
Enterprise value	53.5			based on average EV/EBITDA in the sector
Market capitalisation	48.5			derived from EV, ignoring associates/minorities/pensions

The Institute of Food Technologists' Global Food Traceability Center (GFTC, based in Chicago) created a calculator⁶³ to assess the returns of a GDST-compliant digital solution over a 5-year time horizon. Using that calculator, we can simulate the benefits and costs of implementing a GDST-compliant traceability solution for an average seafood processing company.

It is assumed that its current traceability system is paper-based and that its annual maintenance costs are equal to 2% of sales.

The full list of assumptions made are summarised in Table 6.

Table 6: Costs and Benefits Assumptions Made to Estimate the Returns of Traceability Implementation for the Average Seafood Company.^{64,65}

Item	Current cost	Cost reduction	Comment
New markets/Price premium	n.a.	0%	We assume no new business and no price premium linked to traceability
Lawsuits and liability insurance costs p.a.	2% of sales (annualized)	-10%	These two items are the most difficult to estimate. We have used conservative estimates, even though we believe that IUU-related liabilities can be high.
Average costs of recalls p.a.	3% of sales (annualized)	-25%	
Total information management costs	7% of sales	-25%	Cost reduction of 25% is before maintenance costs of the traceability solution
Scrap/waste/shrink	5% of sales	-50%	Such a level of waste reduction seems high but is achievable. For instance, Thai Union halved its waste to landfill intensity in just two years (2016-18) ⁶⁶
Product handling, storage, stockouts, transportation, refunds and compliance	10% of sales	-2%	Conservative estimate

Under our assumptions, implementing a GDST-compliant traceability solution translates into a net cost reduction equal to 3.4% of sales. Coincidentally, 3.4% is also the average EBIT margin pre-implementation.

Put differently, EBIT margins of the average seafood processing company could double following GDST implementation under the assumptions retained, i.e. before any revenue benefits such as new markets, price premium linked to 'storied fish', reduction in insurance premia, etc.

The investment generates an IRR ranging from 39% to 62%, depending on the implementation costs (5-7% of sales in our assumptions).

Although our average seafood processing company is small in size, such results could be applied to larger companies too, since it was proven that scale does not determine the ability to benefit from traceability in the seafood industry.⁶⁷



Traceability in action: the case study of Norpac⁶⁸

Norpac Fisheries Export (Norpac) is a Honolulu-based seafood processing and distribution company. It also undertakes fishing throughout the Pacific Ocean, harvesting tuna and other pelagic deep-water species. To effectively manage these operations, accurate and timely management of data such as vessel information, catch location, species and weights is a necessity. The management of such data can be very time-consuming when most of it is paper-based and mistakes lead to overtime payments.

For that reason, Norpac developed its own traceability platform. Fish are tagged during unloading or at auction with a barcode containing the fish's origin, catch date, and other relevant data. Upon arrival at the processor, the fish's barcode is scanned and the system automatically prints out a label with both the barcode and readable information. As the fish is partitioned into fillets, new barcodes are attached that link the partitioned product to the original whole-fish barcode.

As a result of traceability data that directly connects to its operating systems, Norpac has reduced overtime from 1,600 hours a month to fewer than 100, decreased its cost of goods sold by 2% and made more efficient inventory management and purchasing decisions.

Depending on the level of Norpac's gross margin and its average employee costs, we estimate that the savings generated were around 1-2% of sales, assuming revenue of USD 96 million.⁶⁹



Case study: Certification, traceability and profitability

There are more than 30 seafood guides and certification programmes developed by NGOs, in addition to governmental certification schemes and community-supported fisheries.⁷⁰ Among those, the MSC programme is the largest: MSC-certified seafood production accounted for 12% of global wild-catch volumes in 2016, with a target to reach 20% in 2020.^{71,72} Although certification programmes like MSC are often criticised for not being sustainable enough,⁷³ this criticism does not normally focus on traceability, which is a key requirement of these programmes, such as MSC's Chain of Custody (CoC) standard. Companies at least partly certified by such programmes (often only a few species, aquaculture sites or fisheries are certified, not the whole company) are thus likely to have traceability systems in place. For instance, DNA testing shows that 99.6% of MSC-certified food is correctly labelled,⁷⁴ whilst around one-third of seafood globally is mislabelled.⁷⁵

Using MSC as an example of the broader certification effort, we have attempted as a thought exercise to better understand the link between the traceability efforts associated with certification and profitability. Our analysis relies on statistical comparison (i.e. correlation, not causation) and does not investigate the benefits and flaws of certification.

We have downloaded the list of all companies certified by MSC CoC and then matched it with our list of 4,600 processing companies. Out of the full list of close to 15,000 companies partly certified by MSC,⁷⁶ 420 appear in our list as being engaged in the processing of seafood. Out of those, 153 companies disclose EBIT margins. We have then compared the 2019 EBIT margins of those 153 companies to the other 1,123 companies in our list that disclose EBIT margins, but do not appear on the MSC list.

We found that regardless of company size or location, the average margin of companies at least partly certified by MSC CoC was higher than for companies not certified by MSC at all. The margin differential is 2.14% (214 basis points or bps) when looking at the simple average of all companies and 409bps for companies generating more than USD 1 billion in revenue. By geography, a margin differential can also be evidenced – see Figure 8.

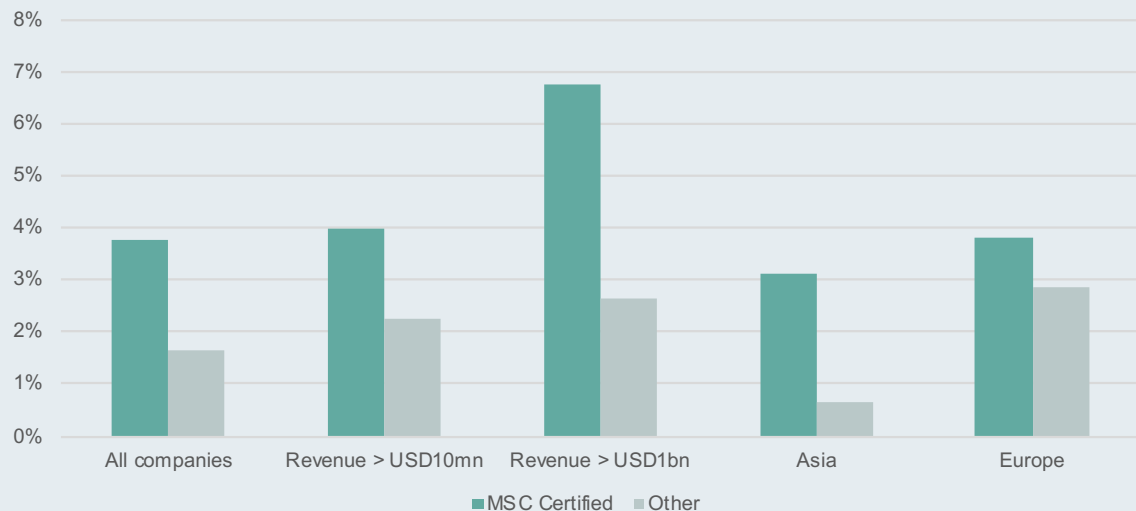


Figure 8: EBIT Margin Comparison (2019) – MSC Certified vs. other Companies.⁷⁷

Note: We are not displaying the margin differential of companies headquartered in North America, South America, Africa or Oceania since not enough companies that simultaneously report EBIT margins and are at least partly MSC certified are headquartered in those continents.

We are not claiming that certification is a driver of margin efficiency, noting correlation is not causation. A preliminary conclusion from the margin differential evidenced is that companies that took steps to be certified by MSC probably end up being more profitable than others. One explanation (although it is a speculation at this stage) is that the requirements in terms of supply chain stewardship have the collateral benefit of rendering operations more efficient. Another explanation could be that MSC-certified products are sold at a price premium to others. However, we have our doubts, as many studies have demonstrated that this is not necessarily the case. Whilst retailers do charge a premium for MSC-stamped products, such premium is not transferred back down the supply chain.⁷⁸

In any case, because securing a certification costs money, the margin differential previously outlined is not a true reflection of the net margin gain associated with certification: there are costs associated with certification, such as monitoring, audit, extra time required for reporting, etc. This could possibly mean that the underlying margin differential between certified companies and non-certified companies is in theory higher than we evidenced, although this would require further work.



TRACEABILITY: A BETTER STRATEGIC CHOICE THAN M&A?

Having shown that traceability is a value-creating investment for seafood processors, in this chapter we compare it to a key strategic alternative: mergers and acquisitions (M&A). Ever present in this fragmented industry (around 400 transactions in the last decade), M&A explains two thirds of the seafood processors' 2017-19 sales growth and is likely to become even more dominant as consolidators take advantage of the COVID-19 related challenges: as of June, the combined transaction value in the industry in 2020 was higher than in all but two years in the past decade.

Yet Planet Tracker demonstrates that in purely financial terms, traceability is likely to be a more compelling proposition since cost savings related to M&A are unlikely to raise margins of the acquirer in the same way traceability would. In addition, and unlike M&A, traceability provides an effective way to reduce risks and raise the sustainability of the industry.

Note: this chapter includes multiple references to financial terms with which some readers might not be familiar. A glossary is provided at the end of this report to facilitate its reading. The argument made here is that among the key ways to increase the profitability of a seafood processor, our research shows that traceability is likely to be a better financial proposition than mergers and acquisitions.

M&A EXPLAINS MUCH OF THE INDUSTRY'S REVENUE GROWTH

Seafood processing is a highly fragmented market

The global seafood processing market is highly fragmented and competitive, probably explaining why margins and cash generation are low.

We calculate that its Herfindahl-Hirschman Index (HHI)^b was about 100 in 2019, which is very low and indicates a high level of fragmentation:⁷⁹ a market with an HHI of less than 1,500 is considered to be a competitive marketplace, while an HHI of 1,500 to 2,500 is moderately concentrated and an HHI of 2,500 or greater is a highly concentrated marketplace.

Significant and constant M&A activity, especially in the most fragmented markets

Companies across the sector have therefore tried to grow through acquisition, as evidenced by our analysis of close to 400 M&A transactions over the last ten years (of which 259 were acquisitions and mergers and the remainder increases in ownership). We excluded cancelled transactions.

^b The sum of the squares of the market shares of each firm within an industry

M&A activity has remained relatively constant, with an average of 36 transactions per year in the sector over the last ten years. Around three-quarters of these transactions involved a target headquartered in Europe or North America. The US, Japan, Spain, France and Norway are countries where companies are the most active at acquiring processors, accounting for one-third of all transactions.⁸⁰ International M&A accounts for 60% of the transactions analysed – see Figure 9.

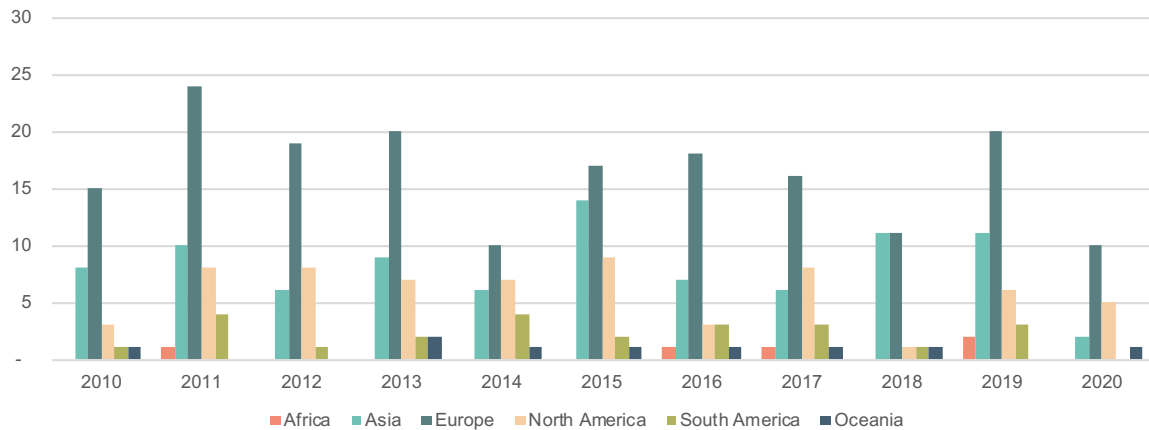


Figure 9: Seafood Processing Market: Number of Transactions by Year and Region of Target (last ten years, as of June 2020).⁸¹

Half of the mergers and acquisitions targeted a company headquartered in just five countries: the US, France, Spain, the UK and Japan, where the number of seafood processing companies is amongst the highest. With the exception of Spain, these are also countries with below average margins for seafood processing, possibly indicating that these markets were targeted by acquirers for their margin accretion potential via consolidation and the associated cost synergies⁸² – see Figure 10.

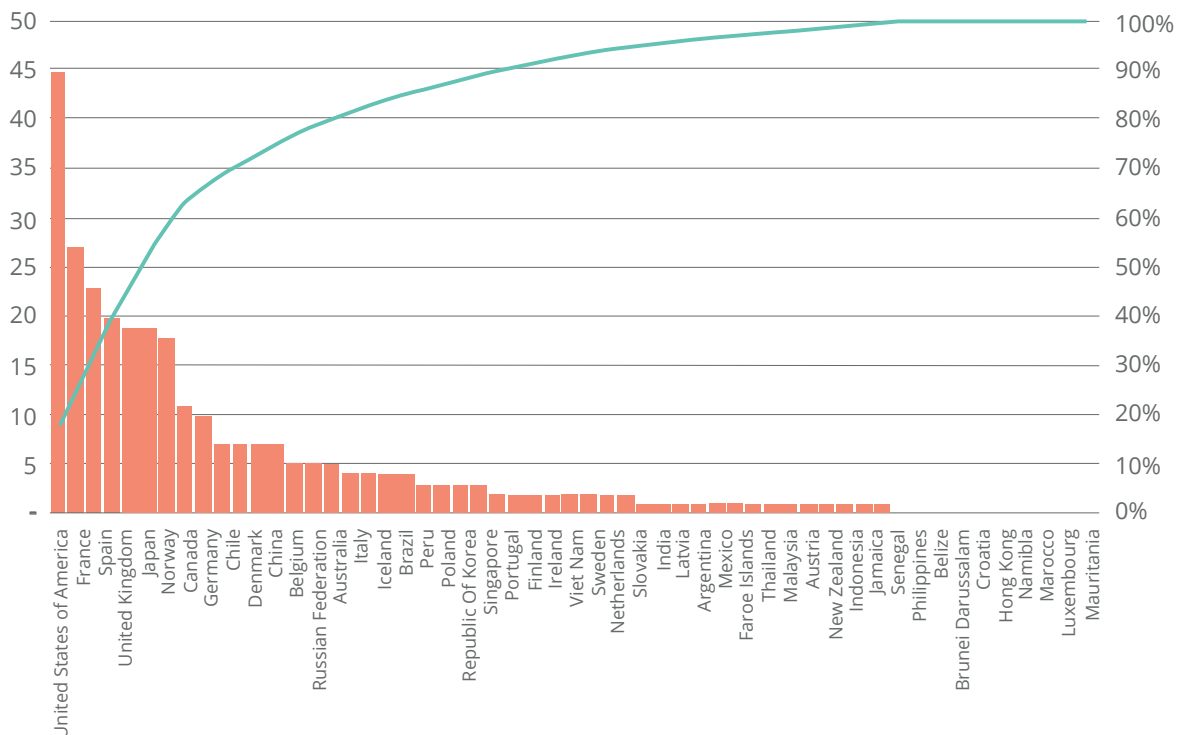


Figure 10: Seafood Processing Market: Number of Acquisitions and Mergers by Year and Country of Target, with Cumulative Proportion of Total (last ten years – as of June 2020).⁸³

Out of the USD 8 billion cumulative transaction value over the last ten years, USD 5 billion was for targets based in Norway or the US.⁸⁴

In 2020, we notice an uptick in M&A activity. As of June 2020, the combined transaction value in the industry was already higher than in all but two years in the past decade.

As a result of the opportunities created by the COVID-19 crisis, where companies with solid finances can afford to buy competitors at discounted prices, it is likely that interest for M&A will remain high in the industry – see Figure 11.

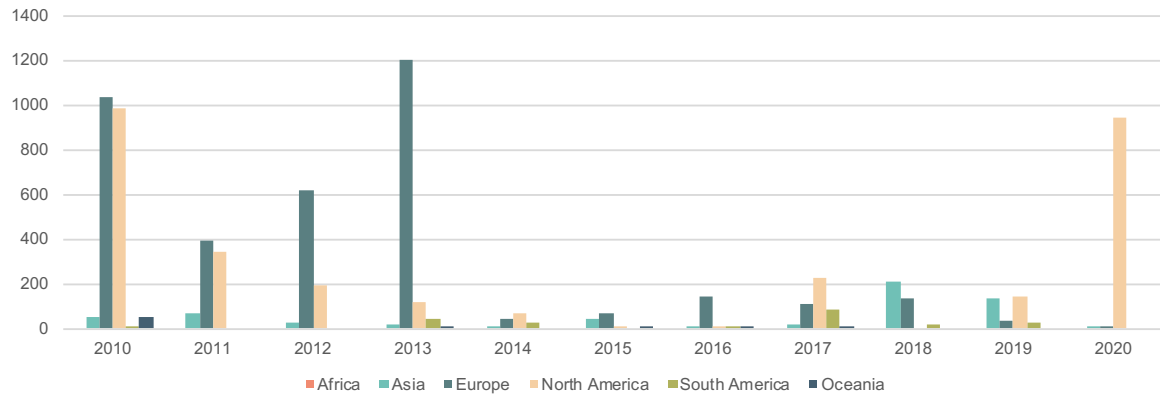


Figure 11: Seafood Processing Market: Combined Transaction Value by Year and by Continent (last ten years, in USD millions, as of June 2020)⁸⁵

Median sales growth of 3% p.a. with an estimated 2% pts coming from M&A

Over the last three years, seafood processing companies have grown on average each year as follows:⁸⁶

Table 7: Seafood Processing Market: Estimated Sales, EBIT and EPS (Earning per Share) 2017-19 CAGR in Local Currency.⁸⁷

	Sales	EBIT	EPS
Median	2.9%	4.0%	-2.4%
Average (unweighted)	7.0%	10.6%	11.2%
Average (weighted)	7.1%	13.9%	3.1%

Overall, we calculate that EBIT margins in the sector have increased by 10-50bps over this period, given the faster EBIT growth rate versus sales growth rate and depending on the growth rate used.

We believe that the median growth rate is more reflective of the actual organic market growth. Indeed, Euromonitor mentions a growth of 2.8% for the processed seafood market over the same period (in USD, at the retail level).⁸⁸

The higher average versus median growth rates (i.e. faster growth at larger companies) almost certainly indicate that a significant part of the growth at the larger companies was powered by acquisitions.

Comparing the revenue of acquired companies to industry revenue, we estimate that over the 2017-2019 period, M&A explains close to 2% points of growth of the industry's median sales growth (2.9%). Put differently, around two-thirds of the industry growth is likely to have been M&A-driven in recent years.

TRACEABILITY BEATS M&A ON RETURNS AND MARGINS

Looking ahead, expected sales growth in the processed seafood market is around 4%, above the general seafood market growth and slightly above current market growth, although these forecasts were made pre-impact of COVID-19.^{89,90,91}

Depending on the severity and duration of the supply chain disruptions caused by COVID-19, the global seafood market is expected to grow between 2.5% and 5.8% over the next five years.^{92,93}

More consolidation to come in the sector

Over the last ten years, seafood processing companies have been acquired on average at a 10.0x EV/EBITDA multiple.⁹⁴ Today, listed companies engaged in that business trade at a 13.9x EV/EBITDA multiple.⁹⁵ Even if not all M&A deals were successful, witness the cancelled purchase of Bumble Bee Foods by Thai Union, this means that on average M&A deals have created value for shareholders. Given the fragmented nature of the industry, the low level of interest rates and the potential 'shopping' opportunities created by the current COVID-19 crisis for cash-rich companies, further consolidation is likely to happen in the sector.⁹⁶

Margin differential between acquirers and targets

The 17 companies engaged in seafood processing with revenue above USD 1 billion – both public and private – generate an average EBIT margin of 4.6%.⁹⁷ Those with revenue below that threshold generate on average a 1.9% margin.⁹⁸

Looking at the EBIT margin of companies mentioned as acquirers in our M&A universe and then comparing it to the margin of those companies which were targets, we compute a 330bps margin difference between targets and acquirers.⁹⁹

Taking the average of these two differences, we believe it is therefore fair to say that on average, potential acquirers have margins which are 3% points higher than potential targets – see Table 8.

Table 8: Seafood Processors: Average EBIT Margin of 'Acquirers' and 'Targets'.¹⁰⁰

Average EBIT margin of companies with revenue above USD1bn	4.6%
Average EBIT margin of companies with revenue below USD1bn	1.9%
Margin difference	2.7%
EBIT margin – Targets	3.5%
EBIT margin – Acquirers	6.8%
Margin difference	3.3%
Average margin difference	3.0%

Taking the sector as a whole, one can then estimate that the synergies linked to future acquisitions required to avoid margin dilution for the acquirers should average at least 3% points of sales.

M&A-driven margin accretion is likely to be lower than that of traceability implementation

In the past ten years, we find that synergies have averaged 6% of acquired sales, based on the examples we analysed where synergy estimates were disclosed:

- Through its acquisition of the Scottish Salmon Company in 2019, Bakkafrøst expected to generate synergies of at least DKK 70 million from 2022 onwards, resulting from feed and procurement savings, equivalent to 5% of acquired sales.^{101,102}
- After the synergy forecast was revised up, Nomad Foods' acquisition of Findus Europe in 2015 was expected to deliver synergies of up to EUR 40 million or 6.7% of acquired sales (approximately EUR 600 million). The original synergy target was EUR 30 million or 5% of sales.^{103,104}
- When High Liner Foods acquired Icelandic Group in December 2011, the synergies were expected to reach USD 16-18 million or 6.3% of the acquired revenue.¹⁰⁵

Depending on the relative size of the target and the acquirer, we can determine the impact of M&A-related savings on the acquirer's margin. For instance, if a seafood processing company purchases another processor with revenue of half its size and an EBIT margin 3% lower, and generates synergies equal to 6% of acquired sales, the combined impact on the new group's margin is exactly +1% - see Figure 12.



Figure 12: Seafood Processing M&A: Synergy-Driven Margin Gains of the Combined Entity Depending on the Relative Size of the Acquirer and the Target, Assuming Synergies at 6% of Acquired Sales and Target's Margin 3% Pts. Lower than the Acquirers.¹⁰⁶

This means that the margin boost coming from synergies generated by acquisitions is very likely to be substantially lower than the savings linked to traceability implementation, calculated to be equal to 340bps for the average company - see Figure 13.

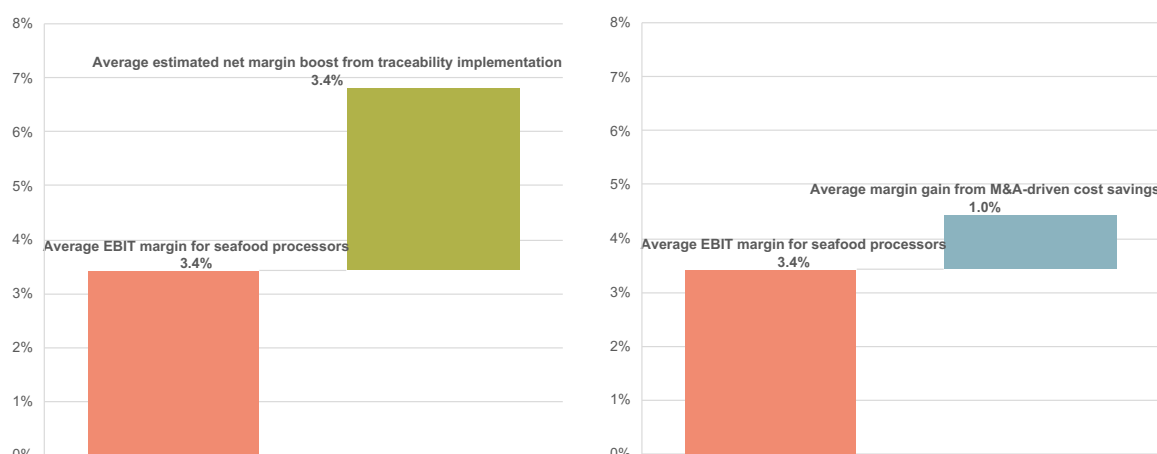


Figure 13: Estimated Average Net Margin Gain from Traceability Implementation Compared to Estimated Average M&A-Driven Margin Gain.¹⁰⁷

Note: Assumptions underlying the M&A-driven margin gains include: target's revenue at 50% of the acquirer's revenue, target's margin 3%pts lower than the acquirer's and synergies at 6% of acquired sales

Comparing returns: M&A with traceability

Having suggested that implementing a traceability solution typically yields a 39-62% IRR over 5 years for the average seafood processing company, we attempted to compare that return to those generated on M&A deals. This is a challenging exercise as companies do not usually provide the information needed to compute the returns generated on a past acquisition. However, if we make the following assumptions:

- a target is typically bought at 10x EV/EBITDA (the average transaction multiple in the sector over the last ten years) and sold in Year 5 at the same multiple;
- synergies equate to 6% of acquired sales (the average of the examples previously mentioned) and are delivered evenly over two years;
- the EBITDA margin of the target is 4.5% (the average margin in the sector) and grows (excl. synergies) at 4% (in line with the median EBIT growth of the sector over the last three years).....

....we can calculate that the IRR on a typical deal in the seafood processing industry must be around 39% - see Table 9.

Table 9: Estimating the Typical IRR on the Acquisition of a Seafood Processor.¹⁰⁸

in USD mn	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Purchase/Sale	(996)					2,749
Synergies		67	67			
EBITDA (incl. synergies)		171	245	255	265	276
Net cash flow	(996)	171	245	255	265	3025
IRR	39%					

Such an IRR is comparable to the lower end of the range of IRR we estimated for a transparency implementation project (39%-62%).

We therefore conclude that traceability implementation is likely to be a source of higher margin gain and higher returns than the M&A route when looking at the seafood processing industry. Importantly, implementing traceability does not carry the same risk as executing an acquisition – it actually reduces the overall risks the company is exposed to.



TRACEABILITY: COMPANY ANALYSIS

Having demonstrated the desirability of traceability for sustainable, strategic and financial reasons, we outline in this section the traceability leaders among the large, listed seafood processing companies, excluding companies for which processing is a minor activity. This is a challenging exercise given the difficulty in exhibiting data and comparing different initiatives launched by companies. Creating our own traceability indicator based on multiple assessments performed by the World Benchmarking Alliance, we conclude that Thai Union and Mowi are traceability leaders. The corollary is that traceability-related opportunities exist at multiple processors across the world. For instance, no large listed seafood processing company has adopted GDST standards yet (Thai Union is the only one so far that has pledged to do so).

METHODOLOGY

The World Benchmarking Alliance (WBA) is a newly launched institution that aims to serve as a public good, offering free, widely available benchmarks to assess corporate performance and business impact in alignment with the SDGs. In October 2019, WBA published its Seafood Stewardship Index, measuring the performance of 30 of the largest seafood companies (including SeaBOS members) using a weighted average score ranging from 0 to 5, across five different areas. One of these areas is “Stewardship of the supply chain”, itself divided into two parts. One of them examines “Traceability and Sourcing”.¹⁰⁹ Five indicators were used by the WBA to measure “Traceability and Sourcing” performance for each company.

These were:

- Disclosure of sourcing policies
- Disclosure of marine and terrestrial ingredients
- Monitoring ingredients’ legal origins
- Well-managed sources
- Traceability of origins

In addition, in its “Ecosystems” category, WBA also tracks companies’ commitment to excluding IUU fish in their supply chains. We include this indicator in our assessment of a company’s traceability effort, as limiting IUU fish cannot be done without proper traceability systems.

Using the raw data from WBA, which scores from 0 (worst) to 5 (best) for each indicator by company, we built a new score, comprising the sum of the scores attributed by WBA to each company for each of these six indicators. Planet Tracker did not participate in the assessment of these companies, we only aggregated the scores attributed by WBA.

Disclaimer

We have used WBA’s scoring system as we believe it is the most comprehensive rating of traceability for seafood companies. We accept that the ratings might not perfectly reflect the reality on the ground. According to WBA, data was collected using publicly available sources, and companies were also invited to participate directly in the data collection process by submitting information through an online questionnaire.¹¹⁰ 20 out of the 30 companies provided additional information.^c

^c The following companies did not provide any additional information: Cooke, High Liner Foods, Marubeni Corporation, Nomad Foods, Pacific Seafood Group, Red Chamber Group, SalMar, Shanghai General Fisheries Corporation, Trident Seafoods, Wales Group (Sea Value & Sea Wealth).

We discuss the reliability of WBA's assessment further by examining FCF Co. Ltd. below.



Case study: Traceability and IUU fish at FCF Co Ltd

Fong Chun Formosa (FCF) is a private company based in Taiwan. It is an integrated supplier of pelagic fish, specialising in tuna, that also trades and processes other seafood at its facilities in Ghana and Papua New Guinea and through more than 30 subsidiaries on all continents. Like Thai Union, the group does not own any vessels but uses 250 associated vessels.¹¹¹

According to WBA, FCF Co. Ltd. is the best-ranked private seafood company on traceability matters and on IUU specifically:

"FCF Co. Ltd. has a robust internal system to monitor the legal origins of its marine ingredients that includes a three-step verification process. First, FCF Co. Ltd. uses a procurement check list to ensure all vessels are authorised by the regional fisheries management organisations (RFMOs) and have obtained the necessary fishing licenses. Next, it passes verification to the illegal, unreported and unregulated (IUU) fishing control team that ensures that no policy violations have occurred. Finally, it conducts internal audits periodically to confirm and enforce compliance with these measures".¹¹²

However, we note that Greenpeace East Asia found evidence of IUU fishing and illegal labour on two vessels linked with FCF in an investigation released in March 2020.¹¹³

Looking forward, it will be interesting to see how the acquisition of Bumble Bee Foods will affect traceability within the organisation. On January 31, 2020, FCF closed the acquisition of Bumble Bee Foods for USD 928 million, after that North American processor of canned tuna filed for bankruptcy in November 2019, following fines levied by the US Department of Justice against the company due to its role in a price-fixing scheme for canned tuna¹¹⁴ – see Table 10.

Table10: *FCF Co. Ltd. and Bumble Bee Foods – Rating of Different Traceability and Sourcing Indicators as per World Benchmarking Alliance.*¹¹⁵

Company	Traceability of origins	Disclosure of sourcing policies	Disclosure of marine and terrestrial ingredients	Monitoring ingredients' legal origins	Well-managed sources	No IUU fish	Combined score
FCF CO	2.5/5	2.5/5	0/5	5/5	2.5/5	5/5	17.5/30
Bumble Bee Foods	2.5/5	2.5/5	1/5	3.5/5	2.5/5	2.5/5	14.5/30

SUMMARY OF FINDINGS

Figure 14 below ranks some of the largest companies engaged in the processing of seafood according to their traceability score, separating listed companies from those privately owned or state-owned.¹¹⁶ A detailed table of each company's score can be found in the appendix "Methodologies used".

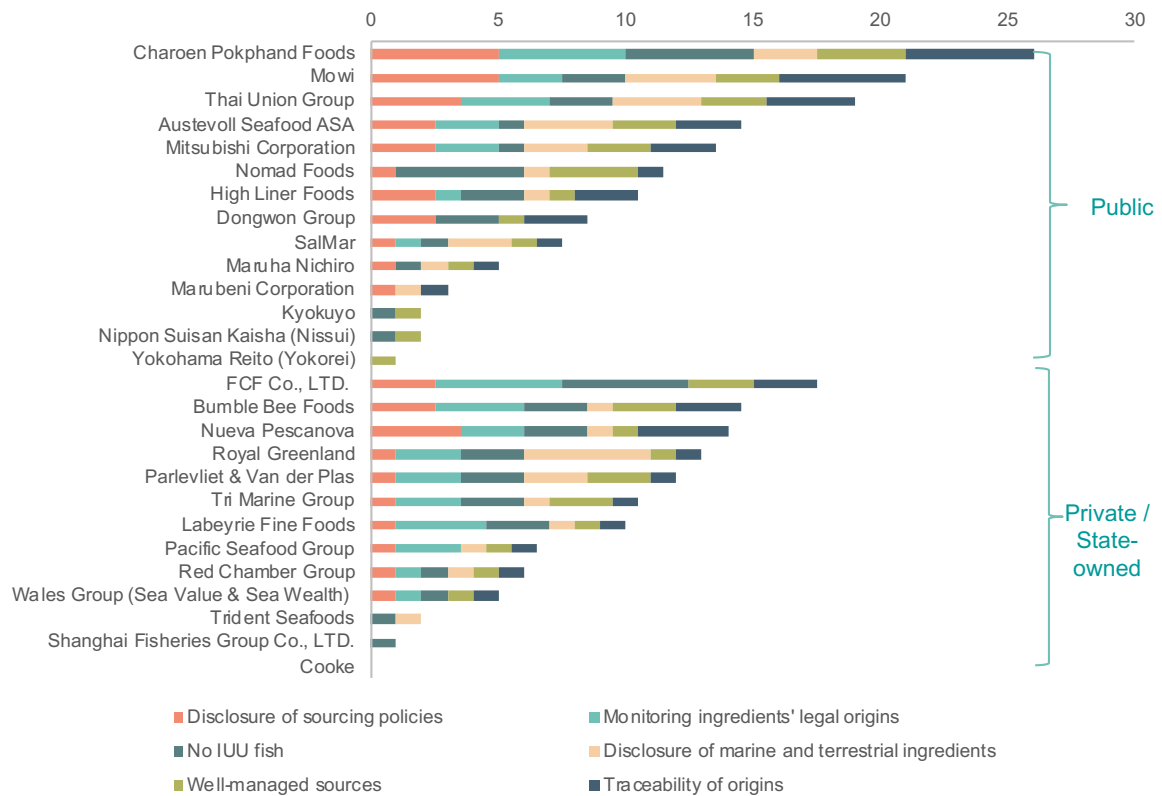


Figure 14: Traceability Score by Company (the higher the better)¹¹⁷

For instance, the company with the best combined score (Charoen Pokphand) has a top score (5) for each individual indicator except "Disclosure of marine and terrestrial ingredients" and "Well-managed sources".

Only two companies, Mowi and Charoen Pokphand, achieve a top score for "Traceability of origins". Interestingly, no company achieves a ranking better than 3.5 for "Well-managed sources".

Note: since the publication of this analysis, Bumble Bee Foods was acquired by FCF Co. Ltd. and Tri Marine Group was purchased by Bolton Group.

COMPANIES LEADING ON TRACEABILITY

We now turn our attention to companies with traceability scores above 15/30, focusing only on public companies with a high proportion of seafood revenue (we have therefore excluded Charoen Pokphand and FCF Co. Ltd. from our analysis). Such companies can be called traceability leaders.

The case studies below provide more details on Mowi and Thai Union, the two traceability leaders identified based on the criteria chosen, although we highlight that many other smaller companies (for instance Austral Fisheries, co-owned by Maruha Nichiro) also use best-in-class traceability solutions.



Case study: Traceability at Mowi

Mowi (previously known as Marine Harvest) is the world's largest producer of Atlantic salmon. Mowi has 41 primary and secondary processing facilities in 19 countries and sold 196,000 tonnes of finished products in 2019 (up 15% year-on-year), making the company the largest global processor of salmon.¹¹⁸ According to WBA, "Mowi discloses detailed information around its core supply chain activities, policies and approaches, leading the benchmark in transparency. It implements a holistic sourcing policy that clearly outlines how the company plans to ensure the sustainability of both land and marine feed ingredients through third-party standards"¹¹⁹ – see Table 11.

Table 11: Mowi – Rating of Different Traceability and Sourcing Indicators as per World Benchmarking Alliance.¹²⁰

Traceability of origins	Disclosure of sourcing policies	Disclosure of marine and terrestrial ingredients	Monitoring ingredients' legal origins	Well-managed sources	No IUU fish	Combined score
5/5	5/5	3.5/5	2.5/5	2.5/5	2.5/5	21/30

In 2019, in partnership with EVERYTHNG, a software company, Mowi launched the "first end-to-end food traceability platform in the seafood industry, delivering full visibility into provenance of Mowi-branded salmon". The platform uses GS1 standards.¹²¹ Interestingly, Mowi considers traceability to be a key branding tool: "As the first brand in our category, with MOWI we introduced our very own traceability tool to the market of seafood in 2019. A fully digitised, available at the touch of your finger tool which provides unique insight into the salmon product you have purchased. [...] Now the consumer can learn more about where the salmon comes from, how long time it spent in fresh- and seawater, where and when it was processed and how it ultimately reached your store".¹²²



Case study: Traceability at Thai Union

Thai Union is one of the largest producers of processed tuna, shrimp and salmon in the world. Listed on the Bangkok stock exchange, the group does not own fishing vessels or aquaculture facilities but is active on four continents through its large subsidiary network and twelve production facilities.

Overall, Thai Union was ranked number 1 on WBA's Seafood Stewardship Index. Looking at traceability and sourcing only, the group was rated as follows - see Table 12.

Table 12: Thai Union – Rating of Different Traceability and Sourcing Indicators as per World Benchmarking Alliance.¹²³

Traceability of origins	Disclosure of sourcing policies	Disclosure of marine and terrestrial ingredients	Monitoring ingredients' legal origins	Well-managed sources	No IUU fish	Combined score
3.5/5	3.5/5	3.5/5	3.5/5	2.5/5	2.5/5	19/30

The group has embarked on multiple traceability initiatives. For instance:

- Thai Union uses a custom-built traceability system (called Trax) providing digital data management tools. It has been expanded in recent years to cover more supply chains and more markets.
- The Group has signed the Adoption Statement of GDST1.0 standards and is committed to working on interoperability for the wider seafood industry.
- In 2019, Thai Union launched its global 'Combating Food Fraud and Food Defense Strategy', to enhance existing work on traceability.
- Its digital traceability pilot programme – the first of its kind in the Thai fishing industry – will soon test scalable platforms for Electronic Catch Data and Traceability (ECDT) systems that utilize mobile applications and satellite connectivity.
- Looking ahead, Chicken of the Sea® has committed to "drive efforts to bring full traceability and sustainability to its aquaculture supply chains".¹²⁴

The next chapter examines companies where further traceability-related opportunities exist. This does not mean that these groups have not implemented any traceability initiatives, but that they could go further. As identified previously, such opportunities might be rewarding for both financial and environmental reasons.

COMPANIES WHERE TRACEABILITY OPPORTUNITIES EXIST

Here we focus on companies with a combined traceability score below 15/30 (based on WBA's scores, not Planet Tracker's), but we exclude entities for which seafood processing is not a significant business. Please refer to the beginning of this section for comments on the scoring methodology used.

Whilst many large seafood processors have some form of traceability mechanism in place, they differ in scope, depth, efficiency, etc. Planet Tracker used WBA's scores to provide an illustrative comparison of efforts implemented by companies.

Traceability-related opportunities exist at most companies covered

The short conclusion is that traceability opportunities exist at the vast majority of companies. Going further and focusing on GDST-compliant traceability solutions, opportunities exist at all companies covered here (large listed seafood processors). Thai Union is the only company in the list ranked by WBA that pledged to be GDST-compliant, but to the best of our knowledge it has not yet implemented a GDST-compliant traceability solution.

The SeaBOS opportunity

SeaBOS is a key forum through which large companies can discuss and share learnings about their traceability issues and ensure that the solutions implemented are compatible (for instance through the use of GDST-compliant solutions). Given SeaBOS's nascent relationship with GDST and its ongoing scientific partnership with the Stockholm Resilience Centre,¹²⁵ it is reasonable to expect that concerted efforts among member companies on the question of traceability will be thoroughly examined and, quite possibly, publicly shared through anonymized research papers. Indeed, members of SeaBOS - Maruha Nichiro, Nissui, Thai Union, Dongwon, Mowi, Cermaq (subsidiary of Mitsubishi Corporation), Skretting (subsidiary of Nutreco), Cargill Aqua Nutrition, Kyokuyo and Charoen Pokphand Food - have pledged to:

- "improve transparency and traceability in [their] own operations, and work together to share information and best practice, building on existing industry partnerships and collaborations."
- "engage in concerted efforts to help reduce IUU fishing and seek to ensure that IUU products and endangered species are not present in [their] supply chains".



Case study: traceability at Maruha Nichiro

Japan-based Maruha Nichiro is the largest seafood company in the world. The company operates in five business segments:

- Fisheries & Aquaculture: wild capture and aquaculture businesses, and the procurement of fish resources.
- Trading: the procurement and sale of marine and livestock products.
- Overseas sales: marine products and processed foods, as well as the production and sale of surimi.
- Processing: manufacture and sale of frozen foods, canned foods, fish sausages, chikuwa, desserts, seasonings, freeze-dried products and chemical products.
- Logistics: storage and transport of frozen products.
- Other: feed storage, shipping, real estate business, and manufacture and sale of furs and pet foods.

It would be interesting to see to which extent traceability investments realised at some of its subsidiaries could be adapted at the group level.

For instance, Maruha Nichiro owns 50% of Austral Fisheries, an MSC-certified fishing company and the first in the world to be carbon neutral (through tree-planting carbon offsets). The company implemented OpenSC technology in its Patagonian toothfish operation and throughout its global supply chain. OpenSC uses machine learning, RFID tagging and QR codes as well as blockchain technology to trace each fish from catch (in Antarctica in the case of Austral Fisheries) to filleting (in Perth) and distribution. An example of their platform can be found [here](#). Although Austral Fisheries does not report its financials, we estimate the company accounts for around 1% of Maruha Nichiro sales, based on the price paid by Maruha Nichiro to buy its 50% stake from Pescanova and average EV/Sales multiples.¹²⁶



Case study: traceability at Austevoll

Austevoll Seafood is a company based in Austevoll (Norway) engaged in the ownership and operation of fishing vessels, fishmeal plants, canning plants, freezing plants, salmon farming and marketing. Norway, UK, Peru and Chile are the group's largest locations. According to WBA: "Austevoll has developed a systematic approach to be more transparent about the origins of its marine ingredients. It publishes a quarterly overview of the total volume fished by the group and its subsidiaries, providing data on the species and tonnage in addition to whether the fish was caught by the group's own vessels or purchased. Austevoll could supplement its current reporting with information about the certified status of its marine ingredients to match that of leading industry peers".¹²⁷



Case study: traceability at Nissui

The second largest seafood company in the world, Nissui has fishery operations in Asia, South America and Oceania, as well as aquaculture operations in Chile and Japan. In addition, the group has a global network of subsidiaries that are active in sourcing, processing and trading seafood products. In the year ending 31/03/2020 (FY2019), Nissui generated sales of JPY 690 billion (USD 6 billion) and an operating income of JPY 23 billion (USD 210 million) through five divisions. According to WBA: "To monitor the legal origins of its marine ingredients, [Nissui] states that it receives certificates of origin. However, Nissui explains that these certificates are not obligatory, which reduces the company's accountability and suggests an overall weak commitment to ensuring the legality of its ingredients. The company states that in 2017 over one-third of Nissui's wild-catch fish were MSC-certified. The company, however, does not show that it has any firm programmes or initiatives in place aimed at increasing the proportion of its products that come from well-managed sources".¹²⁸



Case study: traceability at Dongwon Group

Dongwon Group is a South Korean conglomerate. Its subsidiaries include Dongwon F&B as well as Dongwon Industries, the largest fishing company in South Korea. StarKist, a US-based canned tuna producer, is wholly owned by Dongwon. According to WBA, "Dongwon does not provide any quantifiable evidence of its sourcing and traceability efforts beyond 2015 or at the group level. While subsidiary StarKist reports that in 2015 it purchased 86 percent of tuna from the International Seafood Sustainability Foundation (ISSF) listed vessels, Dongwon does not provide group-wide details about the geographic location, species and certified status of its marine ingredients portfolio. Dongwon could improve transparency around its activities to increase accountability on the traceability of its marine ingredients".¹²⁹



Case study: traceability at High Liner Foods

A publicly-traded Canadian company, High Liner Foods processes and markets value-added frozen seafood products to North American retailers and distributors. According to WBA: "Aside from publishing a CSR strategy on its website, High Liner Foods discloses little information about the stewardship of its supply chain. The company states that it purchased 214 million pounds of seafood in 2017, with 90 percent of it responsibly sourced, yet does not provide specific or in-depth data regarding this purchase. Similarly, High Liner Foods says that it collects key data, such as the country, production or gear method and certification status, for every lot of wild-catch and farmed seafood. However, the company does not provide further information about what system it has in place or how the data is verified".¹³⁰



Case study: Traceability at Yokorei

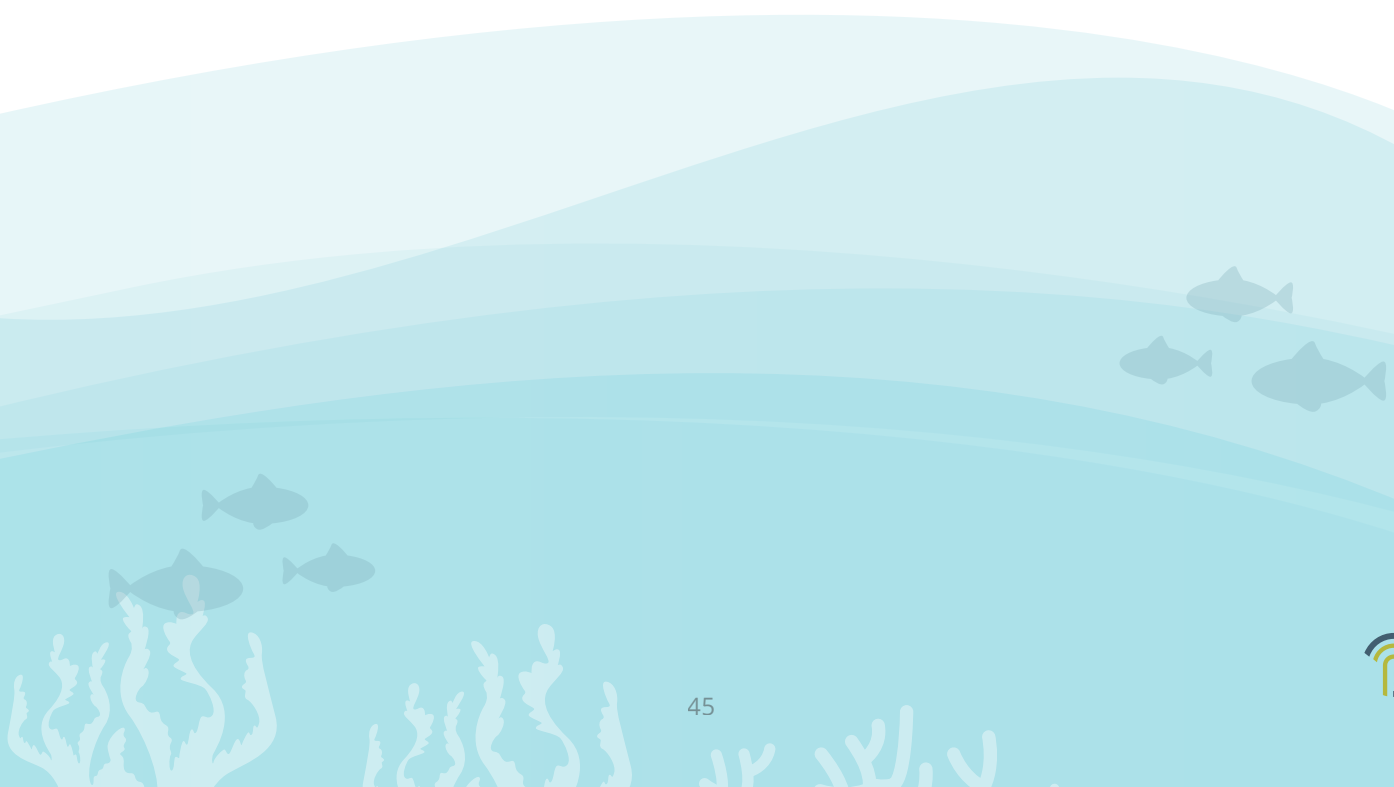
A Japanese company active in importing, processing and distributing seafood products, Yokohama Reito (also called Yokorei) is also involved in refrigerated storage. Whilst some of its sites (e.g., its trout farms in Norway) are certified,¹³¹ the group generally scores poorly on traceability.

As per WBA: “Yokorei does not disclose any information on its traceability mechanisms or sourcing. This lack of transparency limits the company’s accountability for the origins of its seafood products. It is also unknown whether Yokorei is carrying out any activities to improve sustainability performance in this area”.

Planet Tracker identified one possible avenue of improved traceability at Yokorei.

Developed by the Japanese Association of Seafood Traceability (JAST) with funding from Japan’s Fisheries Agency, CALDAP is an information system which provides processors and distributors with catch and landing data for fishery products recorded at fisheries’ co-operatives or auction houses at landing ports. This data includes vessel name, catch area, fishing gear, weight of caught species, landing date, and landing port. Such data is necessary for Japanese companies to export to the US or EU markets for instance, in accordance with the US Seafood Import Monitoring Program (SIMP) and EC regulation No. 1005/2008 respectively.

As of July 2019, Yokorei was one of the three buyers using CALDAP.¹³² Because the company receives the CALDAP data, it would be able to develop a traceability system using that data.



CALL TO ACTION & INVESTOR GUIDANCE

In this report, Planet Tracker has demonstrated the many benefits of implementing robust traceability solutions for seafood processing companies.

A widespread implementation of GDST-compliant, integrated hardware traceability systems would benefit the industry's margins and returns, give confidence to sustainability claims and considerably lower investor exposure to risks such as IUU fishing and food recalls.

Therefore, we urge investors in seafood processing companies to engage with the corporates on this issue, with a view to identifying what traceability initiatives are in place, whether they are GDST-compliant and what are the financial benefits and costs of implementing GDST-compliant traceability.

Below we suggest some questions that may be worth exploring with management:

- Which type of traceability system is in place at the company (paper-based, basic electronic, integrated hardware)? If integrated hardware, is it GDST-compliant?
- Is the traceability system compatible with those of suppliers and clients?
- How much of the seafood sourced/sold is covered by that traceability system?
- Is there any reason why the company should not move to a GDST-compliant integrated hardware traceability system?
- Does the company know the costs and benefits of implementing a GDST-compliant traceability solution? If not, is the company aware of the Global Food Traceability Center calculator to estimate the returns of implementing a traceability solution?
- If the company has provided medium-term margin guidance, are there benefits from traceability included in the guidance?
- Does the company have an M&A strategy (e.g., budget, size of potential targets, types of acquisitions, etc)? Is there a minimum return for potential targets? If so, how does this return compare to that of implementing a GDST-compliant traceability solution?
- How much of the seafood sourced is certified and by whom?
- Does the company plan to increase the share of certified seafood it sells? If so, by when, by how much, and how?
- Are certified operations at the company more profitable than non-certified operations?

APPENDICES

SHAREHOLDERS AND DEBTHOLDERS

The tables below outline the largest shareholders and the largest debtholders of all financial institutions in the companies with the best traceability scores (above 15 out of 30, i.e., Thai Union and Mowi) and the worst traceability scores (less than 5 out of 30, i.e., Nissui, Kyokuyo, and Yokohama Reito) – see Table 13.

Table 13: Largest Shareholders in Selected Companies as of July 20th (in USD mn, with entities that are also large debtholders in one of the companies highlighted in bold).¹³³

Ultimate Parent Name	Thai Union	Mowi	Nissui	Kyokuyo	Yokohama Reito	Total
VANGUARD GROUP, INC.	1	249	34	6	10	300
BLACKROCK, INC.	0	251	22	0	6	279
NOMURA HOLDINGS, INC.	0	1	147	7	12	167
STOREBRAND ASA	-	147	-	-	-	147
SUMITOMO MITSUI TRUST HOLDINGS, INC.	-	2	127	3	6	138
SVENSKA HANDELSBANKEN AB	0	136	0	-	-	136
JANUS HENDERSON GROUP PLC	-	136	-	-	-	136
BANGKOK BANK PUBLIC COMPANY LIMITED	117	-	-	-	-	117
DNB ASA	0	111	-	-	-	111
INVESCO LTD.	-	84	0	-	0	85
ASSET MANAGEMENT ONE CO., LTD.	-	1	81	0	0	82
UNION ASSET MANAGEMENT HOLDING AG	-	75	-	-	-	75
UBS GROUP AG	1	69	1	-	0	72
BNP PARIBAS S.A.	-	71	-	-	-	71
DANSKE BANK A/S	-	68	-	-	-	68
STANDARD LIFE ABERDEEN PLC	3	63	-	-	-	66
DIMENSIONAL HOLDINGS, INC.	2	17	23	4	18	64
GEODE HOLDINGS TRUST	0	62	0	-	0	62
SWEDBANK AB	-	62	-	-	-	62
DEUTSCHE BANK AKTIENGESELLSCHAFT	-	59	1	-	-	60
BANK OF NEW YORK MELLON CORPORATION	0	56	1	1	1	59
CLOSE BROTHERS GROUP PLC	-	50	-	-	-	50
DAIWA SECURITIES GROUP INC.	-	0	38	3	7	48
MIZUHO FINANCIAL GROUP, INC.	-	-	47	-	-	47
MITSUBISHI UFJ FINANCIAL GROUP, INC.	12	2	21	1	2	38

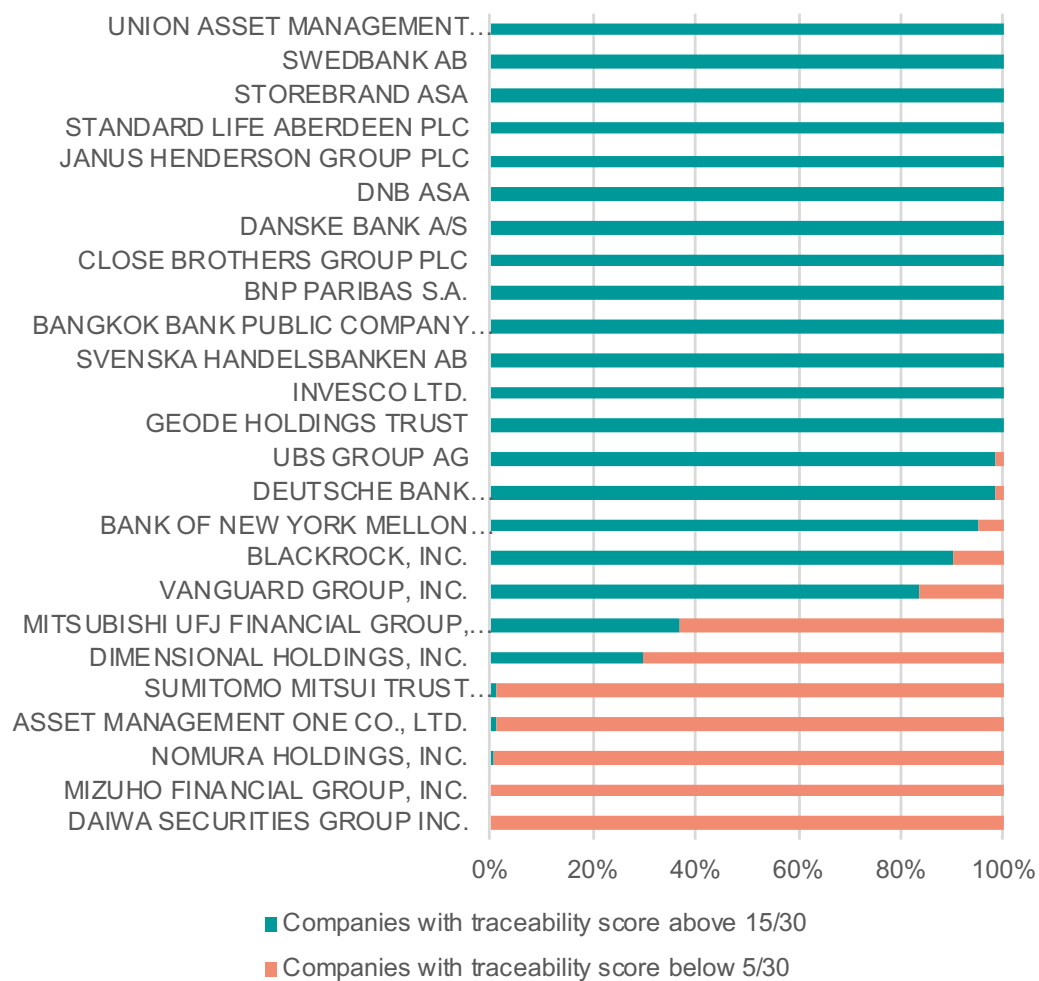


Figure15: Split of Shareholdings Between Companies with High and Low Traceability Scores as a Percentage of Total Shareholdings, as of July 20th.¹³⁴

Table14: Largest Debtholders in Selected Companies as of August 3rd (in USD mn).¹³⁵

Managing Firm Name	Thai Union	Mowi	Nissui	Kyokuyo	Yokohama Reito
EVLI BANK PLC	-	34.5	-	-	-
SVENSKA HANDELSBANKEN	-	17.4	-	-	-
DANSKE BANK A/S	-	15.9	-	-	-
BBL ASSET MGMT CO LTD	13.6	-	-	-	-
SCB ASSET MANAGEMENT CO LTD	11.1	-	-	-	-
LUXCELLENCE MANAGEMENT CO SA	-	10.2	-	-	-
PRUDENTIAL PLC	8.9	-	-	-	-
MONTAGU PRIVATE EQUITY LLP	-	8.8	-	-	-
ALFRED BERG KAPITALFORVALTNING A	-	8.6	-	-	-
SWEDBANK AB	-	7.8	-	-	-
BANK OF ALAND FUND MANAGEMENT CO	-	7.7	-	-	-
SEB	-	6.6	-	-	-
MUTUACTIVOS SA SGIIC	-	6.4	-	-	-
ALTSHULER SHAHAM LTD	-	6.0	-	-	-
GOVMT PENSION INVST FUND JAPAN	-	-	-	-	5.7
TAPIOLA ASSET MANAGEMENT CO LTD	-	5.5	-	-	-
CAIXAGEST SA/PORTUGAL	-	5.4	-	-	-
KRUNGSRI ASSET MGMT CO LTD	5.2	-	-	-	-
CARLSON FONDER AB	-	5.1	-	-	-
WARBURG INVEST KAPITALANLAGEGES	-	4.5	-	-	-
COELI ASSET MANAGEMENT	-	4.1	-	-	-
LANNEBO FONDER AB	-	3.5	-	-	-
CAJA INGENIEROS GESTION SGIIC SA	-	3.2	-	-	-
AMPEGAGERLING INVESTMENT GMBH	-	2.7	-	-	-
SIMPLICITY AB	-	2.7	-	-	-
TAALERITEHTAAN RAHASTOYHTIO OY	-	2.5	-	-	-
SPARINVEST	-	2.3	-	-	-
ALLIANZ SE	-	2.2	-	-	-
E OHMAN J;OR FONDER AB	-	2.1	-	-	-
ARQUIGEST SA SGIIC/SPAIN	-	2.0	-	-	-
THANACHART FUND MANAGEMENT CO LT	2.0	-	-	-	-
SAASTOPANKKI FUND MANAGEMENT	-	1.8	-	-	-
MDO MANAGEMENT CO SA	-	1.8	-	-	-
JUPITER FUND MANAGEMENT PLC	-	1.5	-	-	-
FIRST ASSET MANAGEMENT AS	-	1.5	-	-	-
ARQUIPENSIONES EGFP SA	-	1.5	-	-	-
MERCHBANC SGIIC S A	-	1.4	-	-	-
IPCONCEPT LUXEMBOURG SA	-	1.4	-	-	-
PARETO SICAV/LUXEMBOURG	-	1.4	-	-	-

Managing Firm Name	Thai Union	Mowi	Nissui	Kyokuyo	Yokohama Reito
EUROMOBILIARE ASSET MGMT SGR	-	1.2	-	-	-
DNB ASA	-	1.2	-	-	-
ALANDSBANKEN FONDBOLAG AB	-	1.2	-	-	-
CICERO FONDER AB	-	1.2	-	-	-
PERFECT MUTUAL FUNDS LTD	-	1.1	-	-	-
TAAALERITEHTAAN RAHASTOYHTIO OY	-	2.5	-	-	-
SPARINVEST	-	2.3	-	-	-
ALLIANZ SE	-	2.2	-	-	-
E OHMAN J:OR FONDER AB	-	2.1	-	-	-
ARQUIGEST SA SGIIC/SPAIN	-	2.0	-	-	-
MERCHBANC SGIIC S A	-	1.4	-	-	-
IPCONCEPT LUXEMBOURG SA	-	1.4	-	-	-
PARETO SICAV/LUXEMBOURG	-	1.4	-	-	-
EUROMOBILIARE ASSET MGMT SGR	-	1.2	-	-	-
DNB ASA	-	1.2	-	-	-
ALANDSBANKEN FONDBOLAG AB	-	1.2	-	-	-
CICERO FONDER AB	-	1.2	-	-	-
PERFECT MUTUAL FUNDS LTD	-	1.1	-	-	-
NOMURA	-	-	-	-	1.0

Note: debtholders with a debt value of less than USD 1mn have not been retained.

METHODOLOGIES USED

List of seafood processing companies

To identify the global universe of seafood processing companies, we used FactSet to screen all companies whose NAICS codes were either 3117 (Seafood product preparation and packaging) or 2092 (Prepared Fresh or Frozen Fish and Seafoods).

We avoided double-counting between subsidiaries and ultimate parent companies.

M&A analysis

To build a list of M&A transactions in the seafood processing industry, we used FactSet to list all deals announced over the last ten years where the target's NAICS codes were either 3117 (Seafood product preparation and packaging) or 2092 (Prepared Fresh or Frozen Fish and Seafoods).

MSC-certified companies

We downloaded the list of all companies certified by MSC under their Chain of Custody Standard and matched it with our set of around 4,600 processing companies. Out of the list of 15,000 companies certified by MSC,¹³⁶ 420 appear in our list as being engaged in the processing of seafood. Out of those, 153 companies disclose EBIT margins. Then we compared the 2019 EBIT margins of those 153 companies to the other 1,123 companies in our list that disclose EBIT margins, but which did not appear on the MSC list.

Traceability score

The Seafood Stewardship Index, built by the World Benchmarking Alliance (WBA), measures company performance across five different areas, inspired by the SDGs: governance and management of stewardship practices; stewardship of the supply chain; ecosystems; human rights and working conditions; and local communities.¹³⁷ In total, 60 indicators were used by WBA to assess the performance of each of thirty of the largest seafood companies in these five areas.

Planet Tracker has used six of these indicators and the associated score of each company (as per WBA) to build a custom index measuring each company's performance on traceability. The six indicators used were: B.I.2: Traceability of origins, B.II.1. Disclosure of sourcing policies, B.II.2. Disclosure of marine ingredients, B.III.1. Monitoring ingredients' legal origins, B.III.2. Well-managed sources and C.I.2. No IUU fish. Each company was scored by WBA on each of these indicators between 0 (the worst) and 5 (the best). Then we totalled the scores of each company to create a 'traceability score', where the maximum score was 30 and the minimum was 0.

Table 15: World Benchmarking Alliance Ratings of Different Traceability and Sourcing Indicators for each Company.¹³⁸

Company name	Traceability of origins	Disclosure of sourcing policies	Disclosure of marine and terrestrial ingredients	Monitoring ingredients' legal origins	Well-managed sources	No IUU fish	Combined traceability score	Listed	EV/ EBITDA	Last reported EBIT margin
Charoen Pokphand Foods	5	5	2.5	5	3.5	5	26	Yes	7.62	21.91
Mowi	5	5	3.5	2.5	2.5	2.5	21	Yes	12.81	21.3
Thai Union Group	3.5	3.5	3.5	3.5	2.5	2.5	19	Yes	11.04	4.49
Austevoll Seafood ASA	2.5	2.5	3.5	2.5	2.5	1	14.5	Yes	7.21	12.4
Mitsubishi Corporation	2.5	2.5	2.5	2.5	2.5	1	13.5	Yes	8.32	2.4
Nomad Foods	1	1	1	0	3.5	5	11.5	Yes	11.02	13.9
High Liner Foods	2.5	2.5	1	1	1	2.5	10.5	Yes	7.28	5.3
Dongwon Group	2.5	2.5	0	0	1	2.5	8.5	Yes	4.25	7
SalMar	1	1	2.5	1	1	1	7.5	Yes	13.42	24.9
Maruha Nichiro	1	1	1	0	1	1	5	Yes	11.3	17.08
Marubeni Corporation	1	1	1	0	0	0	3	Yes	4.87	4.4
Kyokuyo	0	0	0	0	1	1	2	Yes	16.8	1.1
Nippon Suisan Kaisha (Nissui)	0	0	0	0	1	1	2	Yes	7.77	3.3
Yokohama Reito (Yokorei)	0	0	0	0	1	0	1	Yes	12.87	10.8
FCF Co., LTD.	2.5	2.5	0	5	2.5	5	17.5	No	_na	_na
Bumble Bee Foods	2.5	2.5	1	3.5	2.5	2.5	14.5	No	_na	_na
Nueva Pescanova	3.5	3.5	1	2.5	1	2.5	14	No	_na	_na
Royal Greenland	1	1	5	2.5	1	2.5	13	No	_na	_na
Parlevliet & Van der Plas	1	1	2.5	2.5	2.5	2.5	12	No	_na	_na
Tri Marine Group	1	1	1	2.5	2.5	2.5	10.5	No	_na	_na
Labeyrie Fine Foods	1	1	1	3.5	1	2.5	10	No	_na	_na
Pacific Seafood Group	1	1	1	2.5	1	0	6.5	No	_na	_na

Company name	Traceability of origins	Disclosure of sourcing policies	Disclosure of marine and terrestrial ingredients	Monitoring ingredients' legal origins	Well-managed sources	No IUU fish	Combined traceability score	Listed	EV/ EBITDA	Last reported EBIT margin
Red Chamber Group	1	1	1	1	1	1	6	No	_na	_na
Wales Group (Sea Value & Sea Wealth)	1	1	0	1	1	1	5	No	_na	_na
Trident Seafoods	0	0	1	0	0	1	2	No	_na	_na
Shanghai Fisheries Group Co., LTD.	0	0	0	0	0	1	1	No	_na	_na
Cooke	0	0	0	0	0	0	0	No	_na	_na

GLOSSARIES

Seafood processing glossary

Term	Definition
Aquaculture Improvement Project (AIP)	A multi-stakeholder effort to address environmental challenges in aquaculture production. ¹³⁹
Aquaculture Stewardship Council (ASC)	An independent non-profit organisation and labelling organisation that establishes protocols on farmed seafood while ensuring sustainable aquaculture. ¹⁴⁰
Best Aquaculture Practices (BAP)	A certification programme created in 2008 by the Global Aquaculture Alliance (GAA) that addresses the four key areas of sustainability-environmental, social, food safety, and animal health & welfare-at each step of the aquaculture production chain. ¹⁴¹
Biologically sustainable fish stocks	A fish stock whose abundance is at or greater than the level that can produce its maximum sustainable yield (MSY) is classified as biologically sustainable. In contrast, when abundance falls below the MSY level, the stock is considered biologically unsustainable. The MSY is the largest yield (or catch) that can be taken from a species' stock over an indefinite period. ¹⁴²
Fisheries Improvement Project (FIP)	A multi-stakeholder initiative that aims to help fisheries work towards sustainability. ¹⁴³
Friend of the Sea	A project of the World Sustainability Organization for the certification and promotion of seafood from sustainable fisheries and sustainable aquaculture. It is the only certification scheme which, with the same logo, certifies both wild and farmed seafood. ¹⁴⁴
Global Aquaculture Alliance (GAA)	An international non-governmental organisation founded in 1997 and dedicated to advocacy, education, and leadership in responsible aquaculture. ¹⁴⁵
Global Dialogue on Seafood Traceability (GDST)	An international, business-to-business platform dedicated to advancing a unified framework for interoperable seafood traceability practices. ¹⁴⁶
Global Good Aquaculture Practices (Global GAP)	A standard that includes a wide variety of species of fish, crustaceans and molluscs and covers the entire production chain from spawning fish stocks to fattening and slaughter. The scope of the standard includes animal welfare, environmental protection, safety at work and food safety. ¹⁴⁷
Illegal, unregulated or unreported fishing (IUU fishing)	All fishing that breaks fisheries laws or occurs outside the reach of fisheries laws and regulations. ¹⁴⁸
International Fishmeal and Fish Oil Organization (IFFO)	The international trade organisation that represents the marine ingredients industry worldwide. ¹⁴⁹
International Seafood Sustainability Foundation (ISSF)	A global, non-profit partnership among the tuna industry, scientists and World Wildlife Fund. ¹⁵⁰
Marine Conservation Society UK (MCS)	A leading marine charity in the UK. ¹⁵¹
Marine Stewardship Council (MSC)	An independent non-profit organisation which sets standards for sustainable fishing. The MSC Fisheries Standard measures the sustainability of wild-capture fisheries. The Chain of Custody Standard ensures the blue MSC label is only displayed on seafood that is traceable to an MSC certified sustainable fishery. ¹⁵²
Monterey Bay Aquarium Seafood Watch (MBA)	A rating programme that helps consumers and businesses choose seafood that is fished or farmed in sustainable ways. ¹⁵³
Seafood processing	The conversion of whole fish or shellfish to various other product forms such as fresh fish fillets or steaks or other items such as frozen products, breaded fish portions, and canned or smoked products. ¹⁵⁴
Sustainable Fisheries Partnership (SFP)	A US-registered non-profit that operates globally to rebuild depleted fish stocks and reduce the environmental and social impacts of fishing and fish farming. ¹⁵⁵



Term	Definition
Sustainable Seafood Coalition UK (SSC)	An association of businesses that sell seafood in the UK, working together to agree on voluntary industry standards on environmental sourcing and labelling, and to collaborate to solve sustainability challenges. ¹⁵⁶
Traceability	The ability to systematically identify a unit of production, track its location, and describe any treatments or transformations at all stages of production, processing, and distribution. ¹⁵⁷
Transshipments	The transfer of catch from one vessel to another. During a transshipment, a fishing vessel meets up with a large, refrigerated cargo-type ship, known as a "reefer". They tie up alongside one another and drift while the fishing vessel offloads its catch before heading back out to the fishing grounds. ¹⁵⁸
World Wildlife Fund (WWF)	A leading organisation in wildlife conservation and endangered species. ¹⁵⁹

Financial glossary¹⁶⁰

Term/ Acronym	Definition
Basis points (bps)	A common unit of measure for interest rates and other percentages in finance. One basis point is equal to 1/100th of 1%, or 0.01%.
Capital expenditures (Capex)	Funds used by a company to acquire, upgrade, and maintain physical assets such as property, buildings, an industrial plant, technology, or equipment.
Compound annual growth rate (CAGR)	A number that describes the rate at which a financial metric (e.g. revenue or profit) would have grown if it had grown the same rate every year
Cost of goods sold (COGS)	The direct costs of producing the goods sold by a company. This amount includes the cost of the materials and labour directly used to create the good. It excludes indirect expenses, such as distribution costs and sales force costs. Also referred to as cost of sales.
Discount rate	The interest rate used to determine the present value in a DCF calculation.
Discounted cash flow (DCF)	A valuation method used to estimate the value of an investment based on its future cash flows. The present value of expected future cash flows is arrived at by using a discount rate to calculate the discounted cash flow.
Earnings before interest and tax (EBIT)	An indicator of a company's profitability. EBIT can be calculated as revenue minus expenses excluding tax and interest. Also referred to as operating earnings, operating profit, or profit before interest and taxes.
Earnings before interest, tax, depreciation and amortization (EBITDA)	A widely used metric of corporate profitability that can be used to compare companies against each other and industry averages. EBITDA is typically calculated from EBIT, to which depreciation and amortization are added back.
Earnings per share (EPS)	A company's net profit divided by the number of common shares it has outstanding.
Enterprise value (EV)	A measure of a company's total value, often used as a more comprehensive alternative to equity market capitalization. EV includes in its calculation the market capitalization of a company but also short-term and long-term debt as well as any cash on the company's balance sheet. Enterprise value is a popular metric used to value a company for a potential takeover.
Enterprise value/ EBITDA (EV/EBITDA)	A ratio used to determine the value of a company, computed by dividing enterprise value by EBITDA. EV/EBITDA multiples can vary depending on the industry. It is reasonable to expect higher multiples in high-growth industries and lower multiples in industries with slow growth.
Enterprise value/ sales (EV/Sales)	A financial valuation measure that compares the enterprise value (EV) of a company to its annual sales. The EV/sales multiple gives investors a quantifiable metric of how to value a company based on its sales, while taking account of both the company's equity and debt.
Free cash flow (FCF)	The cash a company generates after accounting for cash outflows to support operations and maintain its capital assets. Free cash flow is a measure of profitability that excludes the non-cash expenses of the income statement and includes spending on equipment and assets as well as changes in working capital from the balance sheet.
Gross margin	A company's net sales revenue minus its cost of goods sold.



Term/ Acronym	Definition
Internal rate of return (IRR)	A metric used in financial analysis to estimate the profitability of potential investments: it is the discount rate that makes the net present value of all cash flows equal to zero in a discounted cash flow analysis.
Market capitalization	The total market value of a company's outstanding shares of stock. Commonly referred to as "market cap," it is calculated by multiplying the total number of a company's outstanding shares by the current market price of one share.
Net debt	A liquidity metric used to determine how well a company can pay all of its debts if they were due immediately. It shows how much cash would remain if all debts were paid off and if a company has enough liquidity to meet its debt obligations. It is computed as: total debt minus cash and cash equivalents.
Net present value (NPV)	The difference between the present value of cash inflows and the present value of cash outflows over a period of time.
Operational cash-flow	A measure of the amount of cash generated by a company's normal business operations.
Price-to-earnings ratio (P/E)	The ratio used for valuing a company that measures its current share price relative to its per-share earnings.
Synergies	The concept that the combined value and performance of two companies will be greater than the sum of the separate individual parts. Synergy is a term that is most commonly used in the context of mergers and acquisitions (M&A). Synergy, or the potential financial benefit achieved through the combining of companies, is often a driving force behind a merger.



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REFERENCES

- 1 Certifications and Ratings Collaboration (2019) Sustainable Seafood: A Global Benchmark.
- 2 Planet Tracker (2020), based on FactSet data
- 3 Planet Tracker (2020), based on FactSet data
- 4 Global Food Traceability Center (2020). Seafood Traceability Financial Tool
- 5 Seafood Health Facts (2020). Overview of the Seafood Industry.
- 6 Diagram courtesy of FishWise (2018). Advancing Traceability in the Seafood Industry.
- 7 FactSet (2020)
- 8 Planet Tracker (2020), based on FactSet data
- 9 FactSet (2020)
- 10 Planet Tracker (2020), based on FactSet data
- 11 Planet Tracker (2020), based on FactSet data
- 12 Maruha Nichiro (2020). Consolidated Financial Results for the Year Ended March, 2020.
- 13 Planet Tracker (2020), based on FactSet data
- 14 Planet Tracker (2020), based on FactSet data
- 15 Planet Tracker computations (2020), based on FactSet data
- 16 Planet Tracker computations (2020), based on FactSet data
- 17 Planet Tracker (2020), based on FactSet data
- 18 Planet Tracker computations (2020), based on FactSet data
- 19 Planet Tracker computations (2020), based on FactSet data
- 20 Planet Tracker (2020), based on FactSet data
- 21 Planet Tracker computations (2020), based on FactSet data
- 22 Planet Tracker (2020), based on FactSet data
- 23 Planet Tracker computations (2020), based on FactSet data
- 24 Planet Tracker computations (2020), based on FactSet data
- 25 FishWise (2015). Seafood Traceability Definitions.
- 26 WWF US (2019). Risk and opportunity in the seafood sector: The business case for sustainability.
- 27 Food Safety Magazine (2012). Recall: The Food Industry's Biggest Threat to Profitability
- 28 High Liner Foods (2020). Annual Report 2019 – Management Discussion and Analysis.
- 29 IFT (2020). Valuing Traceability Implementation.
- 30 WWF (2015). Illegal Fishing: Which fish species are at highest risk from illegal and unreported fishing?
- 31 Pardo et al. (2016). Misdescription incidents in seafood sector.
- 32 Office of the New York State Attorney General (2018). Fishy Business. Seafood fraud and mislabelling in New York State Supermarkets.
- 33 Seafood Certification & Ratings Collaboration (2019). Sustainable Seafood: A Global Benchmark.
- 34 Roheim et al. (2018). Evolution of the future of the sustainable seafood market.
- 35 Roheim et al. (2018). Evolution of the future of the sustainable seafood market.
- 36 Roheim et al. (2018). Evolution of the future of the sustainable seafood market.
- 37 Roheim et al. (2018). Evolution of the future of the sustainable seafood market.
- 38 MSC (2018). Demand for independent labelling seafood is increasing globally.
- 39 Roheim et al. (2018). Evolution of the future of the sustainable seafood market.
- 40 Fish 2.0 (2015). Traceability: An Investor Update on Sustainable Seafood
- 41 SeafoodSource (2020). First version of comprehensive data standards for seafood traceability released.
- 42 Global Dialogue on Seafood Traceability (2020). Leading Global Brands Change the Future of the Seafood Industry with Launch of New Traceability Standards
- 43 Planet Tracker computations (2020), based on FactSet data
- 44 Planet Tracker computations (2020), based on FactSet data
- 45 Planet Tracker computations (2020), based on FactSet data
- 46 Global Dialogue on Seafood Traceability (2020). GDST Standards and Guidelines for Interoperable Seafood Traceability Systems Version 1.0. Executive Summary.
- 47 Planet Tracker computations (2020), based on FactSet data
- 48 Planet Tracker computations (2020), based on FactSet data
- 49 Global Dialogue on Seafood Traceability (2020). GDST Standards and Guidelines For Interoperable Seafood Traceability Systems Version 1.0 — Statement of Adoption.
- 50 Global Dialogue on Seafood Traceability (2020). Support the Adoption of GDST 1.0I.
- 51 Global Dialogue on Seafood Traceability (2020). Global Tuna Alliance Endorses GDST Standards.
- 52 International Pole & Line Foundation (2020). We are proud to endorse the GDST 1.0 Standards and Guidelines!
- 53 Fish Focus (2020). UK Seafood Industry Alliance Endorses Leading Traceability Standards.
- 54 Global Dialogue on Seafood Traceability (2020). Sea Pact and GDST Announce Joint Work Program — Ten Companies Add Momentum to GDST Uptake.
- 55 Global Dialogue on Seafood Traceability (2019). GDST and SeaBOS join forces.
- 56 Future of Fish (2020). Return on Investment model.
- 57 Adapted from Food and Agriculture Organisation of the United Nations (FAO, 2011). Global food losses and food waste - Extent, causes and prevention.
- 58 Future of Fish (2020). Return on Investment model.
- 59 Sterling et al. (2015). Assessing the Value and Role of Seafood Traceability from an Entire Value-Chain Perspective.
- 60 Sterling et al. (2015). Assessing the Value and Role of Seafood Traceability from an Entire Value-Chain Perspective.
- 61 Future of Fish (2020). Return on Investment model.
- 62 Planet Tracker (2020), based on FactSet data
- 63 Global Food Traceability Center (2020). Seafood Traceability Financial Tool
- 64 Planet Tracker (2020), based on FactSet data
- 65 Global Food Traceability Center (2020). Seafood Traceability Financial Tool
- 66 Thai Union (2020). 2019 sustainability report.
- 67 Sterling et al. (2015). Assessing the Value and Role of Seafood Traceability from an Entire Value-Chain Perspective.
- 68 Future of Fish (2014). Seafood Traceability: The Business Case for Better Data.
- 69 Zoominfo (2020). Norpac Fisheries Export.



70 Roheim et al. (2018). Evolution of the future of the sustainable seafood market.

71 MSC (2017). Global Impacts Report 2017.

72 The Fish Site (2017). MSC sets 20 percent global coverage goal

73 Planet Tracker computations (2020), based on FactSet data

74 Scientist Live (2016). DNA tests show 99% of MSC labelled seafood 'exactly what it says on pack'

75 Pardo et al. (2016). Misdescription incidents in seafood sector.

76 MSC (2020). Find a supplier.

77 Planet Tracker (2020), based on FactSet data. Excluding companies with margin < -100%.

78 Roheim et al. (2018). Evolution of the future of the sustainable seafood market.

79 Planet Tracker computations (2020), based on FactSet data

80 Planet Tracker computations (2020), based on FactSet data

81 Planet Tracker (2020), based on FactSet data

82 Planet Tracker computations (2020), based on FactSet data

83 Planet Tracker (2020), based on FactSet data

84 Planet Tracker computations (2020), based on FactSet data

85 Planet Tracker (2020), based on FactSet data

86 Planet Tracker computations (2020), based on FactSet data

87 Planet Tracker (2020), based on FactSet data

88 Thai Union (2020). Annual Report 2019.

89 Statista (2020). Processed Fish & Seafood.

90 Allied Market Research (2020). Seafood Market Expected to Reach \$193,913.6 Million by 2027.

91 Thai Union (2020). Annual Report 2019.

92 Allied Market Research (2020). Seafood Market Expected to Reach \$193,913.6 Million by 2027.

93 Mordor Intelligence (2019). Global seafood market - growth, trends, and forecasts (2020 - 2025).

94 Planet Tracker calculations based on FactSet data.

95 Planet Tracker calculations based on FactSet data – as of June 1st, 2020.

96 Undercurrent News (2019). EUR400mn turnover fish finger processor up for sale.

97 Planet Tracker calculations based on FactSet data.

98 Planet Tracker calculations based on FactSet data.

99 Planet Tracker calculations based on FactSet data.

100 Planet Tracker (2020), based on FactSet data

101 Fish Focus (2019). Bakkafrøst acquires majority shareholding in Scottish Salmon Company

102 Fish Farming Expert (2019). Scottish Salmon Company nets record earnings in 2018.

103 Food Manufacture (2015). Findus deal to yield £7M more savings than expected

104 Nomad Foods (2015). Nomad Foods Limited Enters into Binding Offer to Acquire the Continental European Findus Group Businesses for £500 million.

105 High Liner Foods (2011). High Liner Foods Completes Acquisition of Icelandic Group's U.S. and Asian Operations.

106 Planet Tracker (2020)

107 Planet Tracker (2020), based on FactSet data

108 Planet Tracker (2020).

109 World Benchmarking Alliance (2019). Seafood Stewardship Index 2019

110 World Benchmarking Alliance (2019). Seafood Stewardship Index 2019. Methodology.

111 World Benchmarking Alliance (2019). FCF Co, Ltd.

112 World Benchmarking Alliance (2019). FCF Co, Ltd.

113 Greenpeace (2020). Taiwan's major global tuna supplier shows "blind spots" to illegal fishing practices and modern slavery

114 SeafoodSource (2019). FCF swoops in for Bumble Bee as it files for bankruptcy.

115 World Benchmarking Alliance (2019). Seafood Stewardship Index 2019

116 Adapted from: World Benchmarking Alliance (2019). Seafood Stewardship Index 2019

117 Adapted from: World Benchmarking Alliance (2019). Seafood Stewardship Index 2019

118 Mowi (2020). Mowi Annual Report 2019.

119 World Benchmarking Alliance (2019). Mowi.

120 World Benchmarking Alliance (2019). Seafood Stewardship Index 2019

121 Evrythng (2019). MOWI: Seafood Industry's First End-to-End Food Traceability Platform Powered By EVRYTHING

122 Mowi (2020). Mowi Annual Report 2019.

123 World Benchmarking Alliance (2019). Seafood Stewardship Index 2019

124 Thai Union (2020). Annual Report 2019.

125 Stockholm Resilience Centre (2019). Continued progress towards healthier oceans.

126 World Benchmarking Alliance (2019). Austevoll.

127 World Benchmarking Alliance (2019). Austevoll.

128 World Benchmarking Alliance (2019). Austevoll.

129 World Benchmarking Alliance (2019). Dongwon Group.

130 World Benchmarking Alliance (2019). High Liner Foods.

131 Yokohama Reito (2020). ASC CoC Certification.

132 Catch and Landing Data Platform (2019). CALDAP.

133 FactSet (2020)

134 FactSet (2020)

135 Bloomberg (2020)

136 MSC (2020). Find a supplier.

137 World Benchmarking Alliance (2019). Seafood Stewardship Index Methodology.

138 World Benchmarking Alliance (2019). Seafood Stewardship Index 2019

139 Sustainable Fisheries Partnership (2020). Aquaculture improvement projects.

140 Aquaculture Stewardship Council (2020). Home page.

141 Best Aquaculture Practices (2020). What we do.

142 FAO (2017). Indicator 14.4.1: Proportion of fish stocks within biologically sustainable levels



143	MSC (2019). Fishery Improvement Projects.
144	Friends of the Sea (2020). Home page.
145	Aquaculture Alliance (2020). Home page.
146	Global Dialogue on Seafood Traceability (2020). Home page.
147	GGN (2016). Global G.A.P. standard for Aquaculture. I
148	Pew Charitable Trusts (2018). FAQ: Illegal, Unreported, and Unregulated Fishing.
149	IFFO (2020). Home page.
150	International Sustainable Seafood Foundation. Home page.
151	Marine Conservation Society (2020). Home page.
152	MSC (2020). The MSC Standards.
153	Seafood Watch (2020). About us.
154	Seafood Health Facts (2020). Overview of the Seafood Industry.
155	Sustainable Fisheries Partnership (2020). Improving wild fisheries.
156	Sustainable Seafood Coalition (2020). Home page. /
157	Fishwise (2015). Seafood Traceability Definitions.
158	Global Fishing Watch (2016). Rendez vous at Sea: What is Transshipping
159	WWF (2020). Home page.
160	Investopedia (2020).

WITH THANKS TO OUR FUNDERS



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This report is funded in part by the Gordon and Betty Moore Foundation through the Finance Hub, which was created to advance sustainable finance.