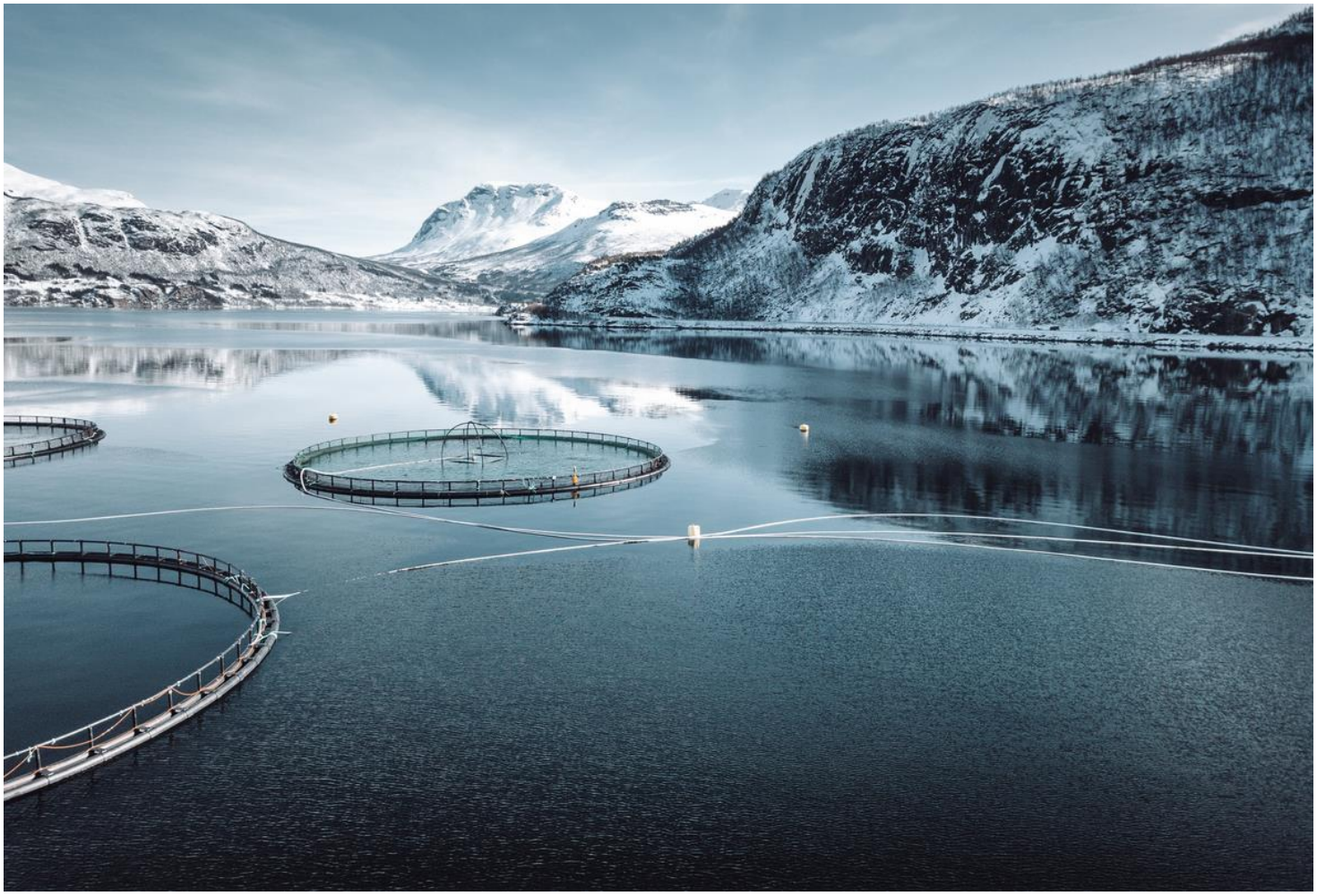
MENON ECONOMICS

REPORT

TAXATION OF AQUACULTURE IN ICELAND

A COMPARATIVE STUDY OF THE EFFECTS OF TAX SYSTEMS IN ICELAND, NORWAY AND FAROE ISLANDS



MENON-PUBLIKASJON NR. 8/2024

Oddbjørn Grønvik, Leo Grünfeld, John Oskar Holmen Skjeldrum, Lotte Leming Rognsås

Preface

This report is conducted by Menon Economics on request by Fisheries Iceland (SFS). The objective is to deepen the understanding of how the recently proposed tax system reform in Iceland will affect the aquaculture industry, both in terms of revenues, value added and international competitiveness. The report presents a model that allows the reader to compare how the proposed tax structure affects the industry comparing the effects of alternatively applying the existing (current) tax structure in Iceland, a Norwegian tax model and the tax model of the Faroe Islands. The study considers all relevant aspects of the tax systems in each country, allowing comparisons to be as complete as possible.

The study was made in the second half of December 2023, and rests extensively on previous mappings of taxes and industry structures performed by KPMG and Boston Consulting Group, yet more information is added to the study.

We are grateful for the opportunity to dive into the tax structures in three key salmon producing countries. We are thankful to Sigurgeir Bárðarson and Þröstur Sæmundsson for efficient information exchange and solid advice. Our thanks also go to the industry players in Iceland and the Faroe Islands as well as the Ministry of the Faroe Islands that allowed us to interview them on short notice.

All conclusions and interpretations are solely the responsibility of the authors.

_____

January 2024

Oddbjørn Grønvik
Senior Economist

Leo A. Grünfeld
Partner

Menon Economics

Table of contents

Addendum January 15th, 2024: The reports section 2.4 was expanded with a text box describing the effective tax rate under the Norwegian aquaculture taxation.

Addendum January 25th, 2024: The reported production costs for Norwegian producers in table 6 and 9 was inaccurate and has been updated.

Executive summary

The Ministry of Fisheries in Iceland recently introduced a new draft bill on aquaculture. The draft bill contains a proposal on revised production fee for aquaculture affecting the aquaculture industry. In this report, we estimate the economic effects of alternative tax regimes on the aquaculture producers in Iceland, with a specific focus on the effects of recently the proposed draft bill. The objective is to deepen the understanding of how the recently proposed tax system reform in Iceland will affect the aquaculture industry, both in terms of revenues, value added and international competitiveness, next year and into the future.

The study presents a tax accounting a model that allows the reader to compare how the proposed tax structure affects the industry comparing the effects of alternatively applying the existing (current) tax structure in Iceland, a Norwegian tax model and the tax model of the Faroe Islands. The study considers all the most relevant aspects of the tax systems in each country, allowing comparisons to be relatively complete.

Iceland is a small and young producer of salmon, but the country has experienced a large increase in salmon aquaculture production volumes over the last year, from around 3 000 tons in 2016 to 45 000 tons in 2022. Unlike Norway and the Faroe Islands, where most of the coastline is available for salmon farming, Iceland conserves a significant portion of its coastline. The value chain is relatively complex involving many businesses, but it is dominated by three larger producers that cover many of the parts of the chain.

We take a corporate perspective on taxation, disregarding taxes on owners, which means we do not focus on dividend taxes or taxes on wealth. The table below lists the relevant taxes which we include in our model.

Table 1: Overview of relevant tax rates[1]

Tax	Iceland (current)	Iceland (proposal)	Norway	Faroe Islands
Corporate tax rate	20 %	20 %	22 %	18 %
Resource tax rate			25 %	
Resource tax minimum deduction (MEUR)			6.23	
Harvest/resource fee	0.5 % - 4.3 %	0.04 % - 8 %	1 %	0.5 – 20 %
Compulsory sales levy (RND+marketing)			0.6 %	
Environmental fee	0.9 %	0.9 %		
Harbor fee	0.7 %	0.7 %		
Est. average depreciation rate of capital	24 %	24 %	11 %	17 %

In terms of general taxation, our analysis restricts its focus to the corporate tax rate as this is by far the most significant general tax. We also show the importance of the tax value of depreciation. The aquaculture specific

[1] Percentages for fees are percentages (%) of value. Percentages for taxes are percentages (%) of profit. The average depreciation is based on an assessment of the typical composition of capital for a fish farmer. Several fees are not fixed but depend on various factors such as the market price of fish. The fees listed in the table are represented as averages based on our best estimates given current price and cost levels.

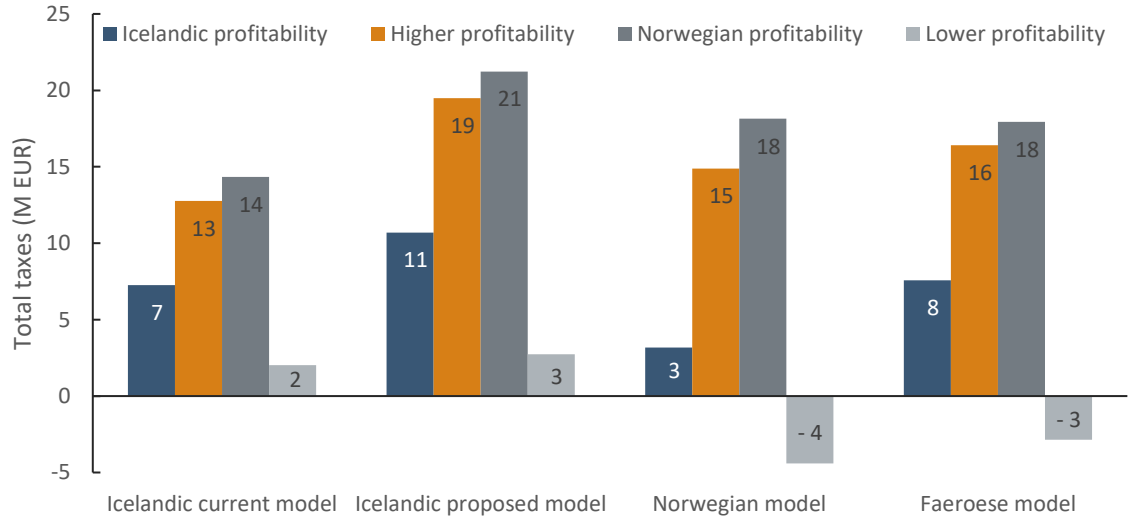
taxation varies in the different cases and are explained in depth in the corresponding sub chapters. While the corporate taxes and the resource tax is based on earnings (revenue minus costs), the other taxes and fees are shown as percentages of the value of the produced fish.

The proposed change of the Icelandic taxation is restricted to an adjustment in the aquaculture taxation. The proposed Icelandic aquaculture taxation is similar to the current system, but with more rates. The new system implies rates that to a larger extent grow with sales prices. We explore this list in chapter 2. The proposal also lists several contingencies that can allow for significant reductions of the fee rate. Production in closed and semi-closed cages would give a deduction of the tax rate. Salmon which has been in the sea for a relatively low time gives a lower fee (50 %). There are also other contingencies which can affect the size of the fee. Additionally, it is proposed that the fee should no longer be a deductible expense before calculation of corporate taxes. This means that the corporate tax no longer will depend on the size of the production fee, as opposed to under the current system.

We study the effect of alternative tax systems based on the 2022 accounts of the three biggest Icelandic firms; Arctic Fish, Arnarlax and Ice Fish Farm. We construct a company based on the average production and productivity of these three firms to model our results. We also test for companies with higher and lower productivity.

In the figure below we present the total taxation for four different firms under the four different tax systems. The columns are grouped together by tax model, and the different firms (productivity) are represented by same-colored columns. The Icelandic firm of 2022 is blue.

Figure 1: Total taxes under the different taxation systems



The Icelandic producers have a relatively low level of profitability. The Icelandic tax model (both current and proposed) can become a relatively heavy burden as the tax does not vary with costs or profits. While the models result in quite similar outcomes if profitability is high, the Icelandic model yields a significantly higher taxation when the profit is lower. As such, the Icelandic systems are not well-suited for situations where profits are low. This is problematic when profits are relatively low, as is and has been the case for Iceland's aquaculture industry thus far.

Furthermore, the Icelandic model is unpredictable since the tax level to a large extent is a function of a global market price which producers cannot influence themselves. For the Icelandic firm of 2022 as well as the other firms with alternative productivity, the proposed tax model represents a worsening of the tax burden. The Icelandic firms already run relatively low profits compared to Norwegian and Faroese fish farmers today. Note that the tax remains the same regardless of how profitable their operations are. If they have low profitability, they may actually be incentivized to reduce production. This can in the worst case prevent the Icelandic industry from realizing the ambitions of growth that have been staked out.

These results imply that the Icelandic model, which is solely focused on the price of fish, seems particularly badly suited given the current profitability of Icelandic producers, which is lower than in Norway and Faroe Islands. The proposed model will in fact worsen the competitive conditions for the Icelandic farmers, as the unfortunate properties of the Icelandic model are enhanced with a relative increase in the tax fees. This result is enforced by the proposal *not* to make the tax a deductible expense, which significantly increases the tax burden when profitability is low.

The report also contains a chapter on how the tax system may affect the long-term competitiveness of the Icelandic aquaculture industry towards 2035. We establish scenarios for a maximum production volume of 150.000 tons, a tripling of today's activity level. We allow for alternative price paths, testing the effect of the tax model under alternative scenarios. As a lower growth estimate, we expect prices to grow by 50 percent in nominal terms in 2035. As a mid-alternative we prolong the price growth of the last ten years, implying a nominal price increase of 100 percent in 2035. A high price scenario is illustrated with a 150 percent nominal price growth towards 2035. Similarly, we model three cost scenarios with similar growth alternatives.

The current Icelandic tax model generates higher profits to the producer in 2035 in all cases, regardless of future price and cost growth trajectories.

If prices and costs grow at the same rate into the future, the proposed Icelandic model proves least profitable after tax. The same is the case if costs grow significantly faster than prices.

If prices grow faster than costs, the proposed Icelandic model yields higher profits than the Faroe model. This is also the case when compared to the Norwegian model, but only if prices grow significantly faster than costs.

Our best guess is a trajectory towards 2035 with symmetric price and cost growth. This implies that the tax costs will be relatively similar in the proposed Icelandic model and the Norwegian model. Notice though, that after tax profits will be negative in Iceland in 2035 and that the proposed model yields the least profits of all models. In this case aquaculture in Iceland will by unprofitable in 2035.

1 Introduction

In this report, we estimate the effects of alternative tax regimes on the aquaculture producers in Iceland, with a specific focus on the effects of recently the proposed draft bill. The objective is to deepen the understanding of how the recently proposed tax system reform in Iceland will affect the aquaculture industry, both in terms of revenues, value added and international competitiveness. The study presents a model that allows the reader to compare how the new tax structure affects the industry comparing the effects of alternatively applying the existing (old) tax structure, a Norwegian tax model and the tax model of the Faroe Islands. The study considers all the most relevant aspects of the tax systems in each country, allowing comparisons to be as complete as possible.

1.1 Background

The Ministry of Fisheries in Iceland recently introduced a new draft bill on aquaculture. The draft bill contains a proposal on revised taxation for the Environmental Fund for aquaculture as well as a revision of the Community Fund (production fee) affecting the aquaculture industry.

The specific fee proposals outlined for consultation are as follows (translated from the original Icelandic):

- Article 70: Annual fee for the Aquaculture Environmental Fund. Aquaculture operators must pay an annual fee of 15 SDR per ton of maximum biomass for each farming area covered by their operating license. The fee should be converted to Icelandic Krona based on the exchange rate, and the funds will go to the national treasury.
- Article 76: Fee amount. The aquaculture operator shall pay a fee to the state treasury on a monthly basis. The amount of the fee per kilogram of slaughtered salmon shall be based on the latest monthly average of the international market price for farmed salmon for the next calendar month before the determination day pursuant to paragraph 1, and subject to the proportion specified in a detailed rate list that we present and discuss in chapter 2 of this report.

In the preparation of the draft, KPMG Ltd. was assigned to carry out calculations on the payment of specific fees for a standardized company within aquaculture in Norway, the Faroe Islands, and Iceland. The objective was to present comparable examples of fee collection. The comparison was limited to specific fees and did not consider the overall taxation of the companies individually in each country. Specific assumptions were made regarding the cost of benchmark companies, investments, and product prices. The results of the analysis indicated that the fee burden in Norway in 2023 would be similar or higher compared to Iceland where the proposed draft reform is implemented.

There is a clear need to apply more thorough and relevant descriptions of the tax systems to enable a solid comparison that also allows for testing the models under alternative market conditions. such as high or low salmon prices, high or low production costs, etc. It is important that such calculations consider all taxes and fees imposed on aquaculture in the mentioned countries, both specific and general. Specific taxes and fees in Iceland include environmental fees, production fees, and harbor fees. A relevant comparison of the impact of imposed tax regimes should also recognize the fact that the development of aquaculture is less advanced in Iceland than in Norway and the Faroe Islands. Consequently, production costs are high relative to sales revenues.

In light of these needs, Fisheries Iceland (SFS) has requested Menon Economics to conduct a mapping of tax effects, to analyze and compare all taxes and public fees imposed on aquaculture companies in Iceland, Norway,

and the Faroe Islands, both specific to aquaculture and general. Moreover, to analyze and compare the estimated production and operational costs per kilogram of salmon produced in aquaculture in Iceland, Norway, and the Faroe Islands and identify key factors influencing cost variations. The analysis assesses the competitiveness of Icelandic aquaculture considering production and operational costs, specific and general taxes and fees of Icelandic aquaculture companies.

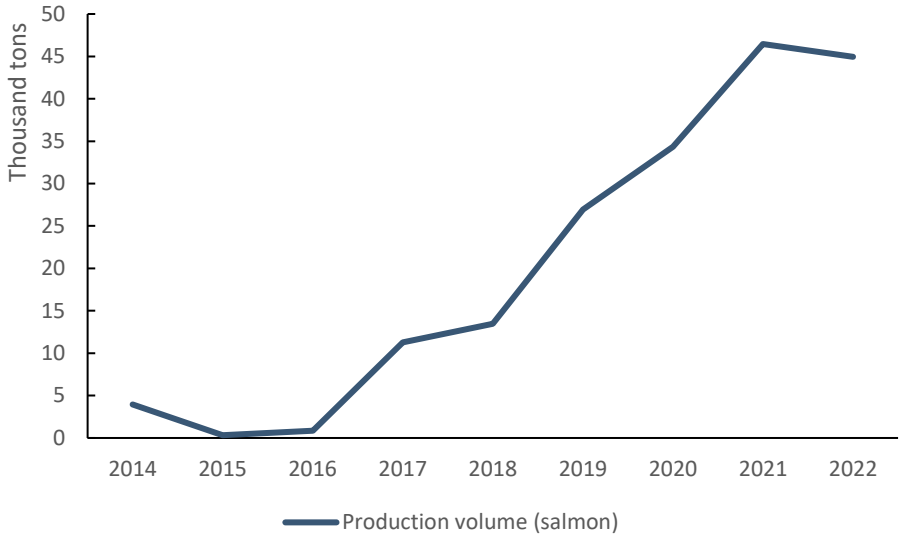
In this report, we focus primarily on the aquaculture taxation systems of the Faroe Islands and Norway, as these are the only countries with specialized taxation policies directly relevant to our study. It's important to note that Chile and United Kingdom (Scotland), two of the largest players in the global salmon farming industry, do not have such specialized taxes or fees of similar importance.

1.2 Briefly on aquaculture in Iceland today

1.2.1 Production and the value chain

Iceland has experienced a large increase in salmon aquaculture production volumes over the last year, from around 3 000 tons in 2016 to 45 000 tons in 2022.

Figure 2: Salmon aquaculture production volumes in Iceland (Source: Statistics Iceland)



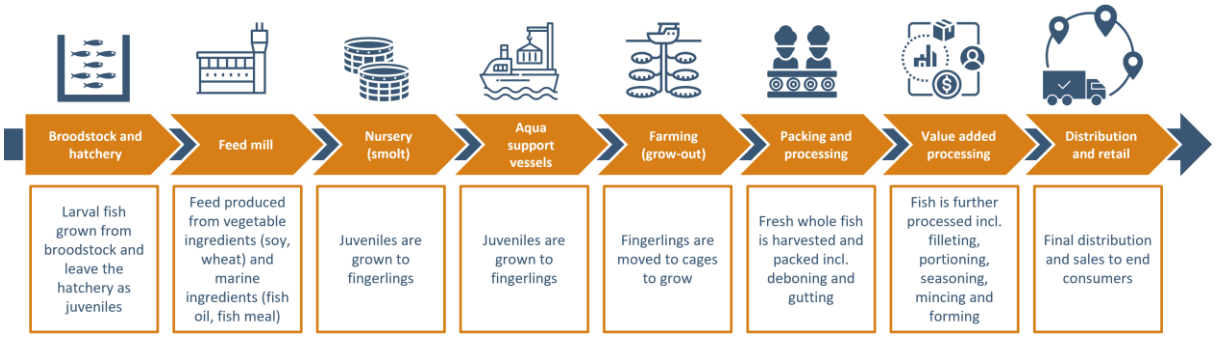
Production volumes are approximately half of what is produced in the Faroe Islands, and 3 percent of Norwegian production volumes. However, production growth rates are much larger in Iceland. Both Norway and the Faroe Iceland have experienced a moderate growth rate of 30 percent during the 6-year period of 2016 – 2022.

In Iceland, aquaculture production is primarily located in the Westfjords and Eastfjords regions. Unlike Norway and the Faroe Islands, where most of the coastline is available for salmon farming, Iceland conserves a significant portion of its coastline. The choice of these specific areas for aquaculture in Iceland is based on suitability considerations in terms of environmental conditions and regulatory frameworks.

The value chain is relatively complex involving many businesses, but it is dominated by three larger producers that cover many of the parts of the chain. These are Ice Fish Farm, Arctic Fish and Arnarlax. The two salmon farming businesses in the Eastfjords, Ice Fish Farm (Fiskeldi Austfjarða) and Laxar Fiskeldi, merged in 2021 and

operates now under Ice Fish Farm. In the Westfjords are Arctic Fish and Arnarlax the main operating businesses. One should also mention some smaller traditional, such as Háafell, which is licensed to farm salmon, and Hábrún, which is licensed to farm cod and rainbow trout.

Figure 3: The value chain. Source: The State and Future of Aquaculture in Iceland by BCG (2023)



The value chain starts with the brood stock and hatcheries. The hatcheries are only based on one genetic code and imports of eggs are abandoned. Hence, there is no competition in the segment for hatchery in Iceland. Benchmark Genetics is the only supplier.

Feed mills and feed production

For feed mills there are two main players. The mills were constructed in the early 1980s. Now, these mills are used to store food for smolt and trout. Due to the aging state of the mills, the quality of the feed suffers, and costs accumulate to keep them functional. A significant hurdle for the industry is the lack of a local feed mill, as it is not capable to serve a potentially growing salmon farming sector. Currently, 99% of feed is imported, which adds to the production costs.

Nursery

Smolt production is conducted in the nurseries, where Iceland has two in the west, one in the east, and on in the Reykjavik area on the south-west coast. Here, the unique access to geothermal energy, which maintains a consistent temperature of around 8 degrees Celsius, creates good conditions for raising smolt to a fair size of approximately 300 grams. Once ready, these smolt can be transported within 20 hours to the west and longer to the east of Iceland, ensuring that both regions can initiate their salmon growth cycles simultaneously. The salmon farmers are mostly self-sufficient with respect to smolt production. Arnarlax has most of the production in the south, and Arctic Fish has all the production in the Westfjords.

Well-boats

As stated, there are three harvest plants operating in Iceland, all three linked to separate well-boat. These three well-boats harvest for three days, stands idle for three days, and are at the harbor for 2 days a week. Compared to Norway, these well-boats have more downtime, which increases the costs. This is also an issue during smolt season. The well-boats are owned by shipping companies in Norway. There are also service vessels that provide support services that operate in Iceland. The biggest is Sjøtækni, which provides services such as diving and net inspections. There are also a foreign company called Abyss Marine Services which provides support services.

Farming

There are primarily three big players in salmon farming in Iceland, these are: Ice Fish Farm, Arnarlax, Arctic fish. Other smaller companies are Háafeel, Hábrún and Ís47.

Packing and processing

Arctic Fish, Ice Fish Farm and Arnarlax have their own harvesting farm, also covering packing and processing. The harvesting costs are around 1 euro per kilogram, which is high for a salmon farming company. One of the reasons for this is the significant overcapacity of the harvesting facilities. The current harvesting volume is around 40 000 tons, and the capacity is at 100 000 tons.

Value added processing.

There is not a lot of value-added processing for the Icelandic salmon farming companies.

Distribution

To distribute the Salmon, the salmon farming companies use domestic trucking companies based in Iceland. They bring the fish to the south and west of Iceland to distribute the fish further, mainly Europe or USA. The sales division are based in-house in the different salmon farming companies.

1.2.2 Regulation and licenses

Regulation and licensing in Icelandic aquaculture are governed by comprehensive processes focusing on environmental impact and sustainability. The licenses for aquaculture in Iceland are auctioned in fjords that have already undergone a carrying capacity and risk assessment. This approach aims to streamline the application processing times. License allocations in these auctions are determined based on five main criteria: price, experience in fish farming, economic viability, measures related to environmental impact, and pioneering in relevant areas, such as fjords where companies have a history of farming fish species.

Furthermore, the production licenses granted specify a maximum allowed biomass (MAB) for all species in a specific fjord, which must be within the limits of the fjord's maximum carrying capacity. This capacity is assessed and determined by the MFRI, focusing on limiting environmental impacts, particularly on seabed conditions and oxygen levels. The MFRI also conducts a risk assessment considering the possibility of genetically blended farmed and wild salmon. This assessment limits the biomass of fertile salmon, as sterile salmon, which cannot reproduce with wild salmon, are not included in this consideration.

The operational backbone of Icelandic aquaculture is a dual model system. The first component is the carrying capacity model, developed by the MRFI, which is applied to every fjord, whether in the east or west. This model is crucial as it regulates the amount of biomass that each fjord can sustainably support. The second component is a comprehensive risk assessment framework that has become a central political issue. It revolves around determining how much fertile salmon each fjord can accommodate without ecological disruption.

In recent years, MRI has developed a sophisticated model, to calculate escape patterns and the associated risks. For instance, if a fishing river contains 100 native fish, the model stipulates that the presence of more than 4% foreign salmon could have detrimental effects on the local ecosystem.

The fishery system in Iceland operates under a full Individual Transferable Quota (ITQ) system, and efforts are underway to implement a similar system in salmon farming. This system is designed to manage the total risk assessment for all fjords, which currently stands at a biomass of 106 thousand tons, equating to roughly 20 million fish per year. Upcoming legislation is expected to allocate salmon shares, with each company potentially holding up to 50 million fish in the sea. Notable companies like Arnarlax and Salmar are projected to own about 25% of these shares.

2 Taxation of Aquaculture in Iceland, Norway and the Faroe Islands

In this chapter we will present the tax systems in the three countries.

2.1 A brief overview of the tax systems

We maintain a corporate perspective and do not consider taxes on owners, which means we do not focus on dividend taxes or taxes on wealth. The table below lists the relevant taxes which we include in our model.

Table 2: Overview of relevant tax rates

Tax	Iceland (current)	Iceland (proposal)	Norway	Faroe Islands
Corporate tax rate	20 %	20 %	22 %	18 %
Resource tax rate			25 %	
Resource tax minimum deduction (MEUR)			6.23	
Harvest/resource fee	0.5 % - 4.3 %	0.04 % - 8 %	1 %*	0.5 – 20 %
Compulsory sales levy (RND+marketing)			0.6 %	
Environmental fee	0.9 %	0.9 %		
Harbor fee	0.7 %	0.7 %		
Est. average depreciation rate of capital	24 %	24 %	11 %	17 %

**The Norwegian harvest fee is set at a fixed level of NOK 0,9 per kg HOG. This corresponds to a fee of about 1 % per kg given a salmon price of EUR 7 per kg and current exchange rates. The Environmental fee and harbor fee depend on factors not listed here and are represented as the estimated average impact which corresponds to a percentage of 0.9% and 0.7%.*

In terms of general taxation, our analysis restricts its focus to the corporate tax rate as this is by far the most significant general tax.[2] We also show the importance of the tax value of depreciation. The aquaculture specific taxation varies in the different cases and are explained in depth in the corresponding sub chapters. While the corporate taxes and the resource tax is based on earnings (revenue minus costs), the other taxes and fees are shown as percentages of the value of the produced fish.

[2] *One can argue that we should include employer's tax (the tax an employer has to pay based on the wage costs). This tax varies between 0 % - 14,1 % (Norway), 6,35 % (Iceland) and 0 % (Faroe Islands). The theoretical impact of an employer's tax is equivalent to the employees' tax on income, as they affect the price of labor symmetrically. Should we include the employer's tax, it would be consistent to also include tax on income. The impact of the employer's tax and the marginal tax is partially a question of tax incidence between employer and employee, as the firm doesn't carry the full burden of these taxes. As the labor costs typically amount to around 10 % of the operating expenses of the aquaculture firms, it is in any event not very significant, and we choose not to include it in our analysis.*

2.2 Iceland – current system

General taxation

The corporate tax rate in Iceland is 20 %. For 2024, the rate is temporarily increased to 21 %, but in our model we choose to keep the rate at 20 % as we expect it to fall back to that level in the future. This rate lies between the rates of Norway and Faroe Islands.

When exporting fish, the farmers also face a harbor fee. While it varies, on average we estimate it to be around 0,7% of the value of the fish.

The tax depreciation rules for capital goods typically used in aquaculture vary, and we estimate the average depreciation rate of relevant capital to be around 24 %, which is the highest of all three countries.

Aquaculture taxation

The current Icelandic aquaculture taxation is a harvest fee with three rates that depend on the level of a reference price. The tax rate increases as the reference price rises. If the price is lower than EUR 4.3 per kg, the rate is 0,5 %. If the price is between EUR 4.3-4.8, the rate is 2 %. If the price is higher than EUR 4.8, the fee is 4.3 %. This means that the fee is independent of cost levels. The production fee is deductible before corporate taxes are calculated, and as such the fee in isolation reduces the corporate taxation.

In addition, there is an environmental tax which is based on the producers' allocated license capacity. Given the productivity in recent years, this fee roughly corresponds to 0.9 % of the value of the fish.

2.3 Iceland – proposed system

The proposed change of the Icelandic taxation is restricted to an adjustment in the aquaculture taxation.[3] The proposed Icelandic aquaculture taxation is similar to the current system, but with more rates. The new system implies the following rates:

1. 0.04% when the price is lower than 6 euros per kilogram,
2. 2% when the price is 6 euros per kilogram or higher but lower than 7 euros per kilogram,
3. 3.6% when the price is 7 euros per kilogram or higher but lower than 8 euros per kilogram,
4. 5.2% when the price is 8 euros per kilogram or higher but lower than 9 euros per kilogram,
5. 6.8% when the price is 9 euros per kilogram or higher but lower than 10 euros per kilogram,
6. 7.6% when the price is 10 euros per kilogram or higher but lower than 11 euros per kilogram,
7. 8% when the price is 11 euros per kilogram or higher.

The reference price is stated to be an international price of Atlantic salmon, which we understand to be interpreted as the Fish Pool prices. The fee is calculated every month based on the average monthly price for the preceding month and on the harvest volume of the following month.

---

[3] *There is also a proposal to change the calculation of the Environmental fee. The full details of this proposed change are not finalized at the time of writing this and is therefore not assessed in this report.*

To put the proposal in a context, the table below lists the share of weeks in a year where the prices have been below the price thresholds. As Salmon prices have increased a lot in recent years, an increasingly larger share of the weeks has prices at the higher thresholds. In 2023, no weeks have had prices below the lowest threshold. 24 % of the weeks have had prices in the second-lowest threshold, which would have yielded a 2 % fee. 25 % of the weeks (49 % - 24 %) have been in the third-lowest threshold, which would have yielded a fee of 3.6 %. 6 % of the weeks (100 % - 94 %) of the weeks would have been at the highest proposed level. [4]

Table 3: Share of weeks with prices below price threshold in the proposed Icelandic model. Source: Fish Pool Index

Price (Eur/kg)	2020	2021	2022	2023
6	72 %	60 %	2 %	0 %
7	91 %	96 %	29 %	24 %
8	96 %	100 %	52 %	49 %
9	100 %	100 %	65 %	65 %
10	100 %	100 %	79 %	86 %
11	100 %	100 %	92 %	94 %

The proposal also lists several contingencies that can allow for significant reductions of the fee rate. Production in closed and semi-closed cages would give a deduction of the fee of 75 and 60 % respectively. Salmon which has been in the sea for a relatively low time gives a lower fee (50 %). There are also other contingencies which can affect the size of the fee.

Additionally, it is proposed that the fee should no longer be a deductible expense before calculation of corporate taxes. This means that the corporate tax no longer will depend on the size of the production fee, as opposed to under the current system.

It is proposed that the new system is phased in gradually, being in full effect from 2028. In the remainder of the report, we do not consider this feature, but rather show the effect of the tax system as it is fully implemented.

2.4 Norway

General taxation

The corporate tax rate in Norway is 22 %, which is the highest of the three countries.

The tax depreciation rules for capital goods typically used in aquaculture vary, and we estimate the average depreciation rate of relevant capital to be around 11 %, which is the lowest of the three countries.

Aquaculture taxation

The Norwegian taxation of aquaculture changed significantly from 2023, when the resource tax was introduced. The resource tax is a special tax which aims to tax a portion of the "resource rent" (sometimes referred to as super profit) which can be generated in the sea phase. The tax is applicable for every firm with license to produce salmon or rainbow trout in the sea. For each firm the tax authorities calculate a resource rent, and an extra tax of 25 % is applied to that surplus. Thus, the effective tax rate for a firm which strictly produces salmon in the sea

[4] *We note that these shares are listed by week, while the fee is to be calculated on a monthly basis.*

phase is the sum of the corporate tax and the resource tax, i.e., 47 % at the current rates (before minimum deduction, see below).

The resource tax is also symmetrical in that the state also compensates when the firms are running at a loss. In that event, the loss is carried on to future years and can be deducted with interest on future tax.[5]

One of the most important features of the resource tax is that it taxes based on actual earnings of the firms, which means that the tax burden corresponds with the profitability of a firm. The resource tax can in theory be said to be neutral in an economic sense, as the producer's incentives to produce are not distorted due to the symmetry of higher taxes when firms generate surpluses and tax refunds when they generate losses.[6]

There is also a minimum deduction in the tax of around EUR 6 million (70 MNOK). This means that the resource tax is only applied on the resource rent that exceeds the minimum deduction. For firms with a relatively low production, this deduction can give a significant reduction in the resource tax.

In addition, there are several special fees for the Norwegian aquaculture industry. There is a production fee, which is at a fixed level that currently amounts to about EUR 0.08 (NOK 0.90) per kg harvested salmon. The production fee is fully deductible in the resource tax, and as such doesn't add an extra burden to the total taxation of the firms.[7] There is both a marketing and RND fee based on the value of the export, which are 0,3% each. The RND fee is fully deductible in the resource tax like the production fee, while the marketing fee is not.

It is worthwhile to note that the Norwegian industry has had variable profitability since the industry's nascency in the 1970's. There are several years where the industry has generated losses that included many bankruptcies. It is only in more recent years that the industry has generated stable and relatively large profits.[8] It can be said that Norway, during the growth phase of its own industry, did not implement specific taxation, and that this absence of specialized taxes or fees provided significant room for the industry to expand. [9]

---

[5] The authorities have proclaimed that they intend to make the tax deduction instantaneous in the future (i.e. that losses are not carried on into the future, but paid back yearly to firms who do not generate a surplus)

[6] In practice, there are several features of the resource tax which does not make it completely neutral. The minimum deduction is one such example, as it incentivizes producers to organize companies into smaller entities.

[7] Note that this only applies when the companies are in a position to pay a resource tax. In the event that they don't generate a surplus or that the surplus is below the minimum deduction, the production fee will be paid in its full amount.

[8] See e.g. the Norwegian resource tax commission ("NOU 2019: 18 Skattlegging av havbruksvirksomhet") for more information on the history of the industry and its profitability.

[9] It should, however, also be noted that introducing a significant taxation once profitability has been achieved, has the properties of a "windfall tax", where taxes rise only when profits are high. If this is expected in advance by industry players, this taxation approach can in fact reduce incentives to achieve profitability. Thus there is a strong argument for introducing the taxation at an earlier point. Note again that this is only an applicable argument if the taxation is profit based and neutral (i.e. sharing profits and losses symmetrically with the tax authorities, such as a resource tax), as it always will be preferable for a firm if a tax that does not have a cost sharing (such as the Icelandic production fe) component be postponed/never introduced.

Text box 2.1: What is the effective tax rate in the Norwegian aquaculture tax regime?

For an aquaculture firm engaged in production in the sea phase, the effective tax rate will vary between depending on the size of their profits due to the minimum deduction. Their activities in the sea phase will have a marginal tax rate of 22 % until profits reach the minimum deduction, while profits exceeding the minimum deduction will face a marginal tax rate of 47 % (22+25 %).

- Excluding other taxes and fees, a firm exclusively engaged in production in the sea phase with profits of EUR 12 million will thus face an average tax rate of 34,5 %, as half the profits are taxes with a marginal rate of 22 %, while the other half is taxed at a marginal rate of 47 %. The firm will pay corporate taxes amounting to EUR 2,64 million (12*22%), while the resource tax will be EUR 1,5 million ((12-6)*(25%)=6*25%).

The resource tax as a share of the firms total taxation is around 36 % (1,5/(2,64+1,5)). With higher profits, the minimum deductions relative importance shrinks, and the average tax rate approaches the marginal tax rate on the profits exceeding the minimum deduction. In the law proposal to parliament, the Norwegian ministry of Finance referenced estimates by the Norwegian tax authority which indicated that 18 players would be in a position to pay resource tax given accounts for 2021 (i.e. profits exceeded the minimum deduction). By comparison, about 100 players have licenses to produce salmon in the sea (which again are roughly controlled by about 60 parent companies).

Furthermore, the average tax rate for the total enterprise will be lower for firms engaged in other activities than production in the sea phase. This means that the effective tax rate for an aquaculture firm engaged in more than production in the sea phase, the effective tax rate will vary between the different parts of their enterprise. For a firm which has a long value chain and pays significant taxes for activities outside the sea phase (e.g. slaughtering, processing, feed production, etc.), the resource tax as a share of total taxation will be lower than for a firm which has similar profits in the sea phase but does not have other activities.

- If we assume that a firm with activity in the sea phase as in the previous example also has profits from other activities amounting to an additional EUR 18 million, this firm will pay an additional corporate tax of EUR 3,96 million. The resource tax as a share of this firms total taxation will thus be 19 % (1,5/(2,64+1,5+3,96)=1,5/8,1).

While expanding activity beyond the sea phase does not affect the marginal tax rate of activities in the sea phase, the example illustrates that the resource tax will not necessarily dominate a firm's total taxation.

2.5 Faroe Islands

General taxation

The corporate tax rate in Faroe Islands is 18 %, which is the lowest of the three countries.

The tax depreciation rules for capital goods typically used in aquaculture vary, and we estimate the average depreciation rate of relevant capital to be around 17 %, which is between the levels of Iceland and Norway.

Aquaculture taxation[10]

Fish farmers on the Faroe Islands pay a harvesting fee. The obligation to pay a production fee applies to all who operate commercial licenses for aquaculture in the Faroe Islands. This covers activities at smolt stations and fish farming in the sea. The tax is regulated in Parliamentary Act no. 64 from May 15, 2014 on the compulsory tax on farming, and amendments in Legislative Decree no. 75 from 1 June 2023. Further details are outlined in legal announcement no. 93 of 25 July 2023.

The total fee is calculated based on the monthly harvest of farmed fish in weight, multiplied by the average international market price in the same month. The rate of the fee varies and depends on the difference between the sales price and the production costs of the Faroese industry.

The fee is set as follows: P = average international market price in DKK per kg. C = average production cost in DKK per kg.

Calculation	Fee (%)
P<C	0.5%
C ≤ P < C+5	2.5%
C+5 ≤ P < C+15	5.0%
C+15 ≤ P < C+20	7.5%
C+20 ≤ P < C+25	10.0%
C+25 ≤ P < C+30	12.5%
C+30 ≤ P < C+35	15.0%
C+35 ≤ P < C+40	17,5%
P≥C+40	20.0%

Production costs are calculated according to the following formula:

Production cost =

- Costs for raw materials and auxiliary materials
- Inventory changes
- other external costs, total and detailed
- personnel costs
- depreciation and write-down costs
- ÷ the production fee to the national treasury.

The reference cost and prices are the same for all companies. The **price** of salmon at Fish Pool (Fish Pool Index) is used to set prices. The price is set based on weekly prices aggregated to a monthly price. The production cost is a weighted average (by production volume) of the three active companies in the Faroe Islands.[11]

[10] The information in this section is based on information gathered from interviews with representatives of the Faroese government and an Industry player of the Faroese Islands.

[11] The three companies are Bakkafrost, Hiddenfjord and Mowi, with an approximate production share of 70, 20 and 10 percent respectively.

Costs from most operations within the company, from smolt costs to costs during the sea phase, but also slaughtering and processing[12], are included in the calculation for production costs. Because the Faroese aquaculture companies have different value chains, their input to the cost function also varies with respect to the length of their value chain. The items used in the calculation are those stated in the operating account, see further details in appendix I. The Minister publicly announces the average production cost every half-year.

The production cost used at the time of writing is DKK 50,45, or around EUR 6,8. Production costs are calculated for October-March and for April-September each year. The harvesting fee is deductible before corporate taxes are calculated, and as such the fee in isolation reduces the corporate taxation.

The last change to the harvesting fee was made in June 2023, with details announced in July 2023. The changes included a doubling of the high end of the fee rate, from a maximum of 10 percent of the revenue base to 20 percent of the revenue base. The model was also altered to account for changes in production costs. Before the last change another system was in place, where the maximum rate was set to 5 percent. Our informants indicate that it is likely there will be further amendments to the system, as it has been criticised by the industry for not being compatible with the high share of contracted sales (as opposed to sales in the spot market).

2.6 Summary

The general Icelandic, Norwegian and Faroese taxation systems are quite similar, with Norway having a somewhat higher corporate taxation and lower depreciation rates for the capital most typically used in the aquaculture industry, while the Faroe Islands has the lower corporate tax.

In terms of aquaculture specific taxation, the countries have very different systems. Norway employs a relatively complex resource rent taxation, which to a more precise degree can account for variations in profitability, both at an aggregate level and between firms. The Icelandic model (both current and proposed) are strictly based on price levels, which means that the tax burden is not strictly connected with variation in costs/profitability – as these are not necessarily correlated with prices in a given year. The Faroe Islands employ a system which can be seen as a hybrid between the Norwegian and Icelandic systems. It can account for variation in profits at an aggregate level but does not have an individual component. If a firm in the Faroe Islands has profits that diverge from the average, their tax burden can thus be larger or smaller than the burden of the average company.

[12] *Included to a limited extent, as it is only Hiddenfjord that to a limited extent engages in Value-Added Production.*

3 The effect of alternative tax systems on a typical Icelandic producer

In this chapter we delve further into how the proposed Icelandic tax system works for actual profitability of the Icelandic producers. We then discuss how the different countries' tax systems affect a generic producer under varying profitability.

3.1 How does the Icelandic tax system affect the Icelandic producers?

In this chapter we show how the current and proposed systems affect the Icelandic producers. The assessment is based on the 2022 accounts of the three biggest Icelandic firms; Arctic Fish, Arnarlax and Ice Fish Farm.

We use the average production and productivity of these three firms to model our results. On average, these firms produced about 11 200 tons fish in 2022, at an average price of EUR 8.4 per kg and at a production cost of EUR 7.45 per kg (OPEX + capital depreciation) before taxes and fees.

We do not consider the effect of the different contingencies which can allow for a reduced fee in this section (production in closed/semi-closed cages, shortened duration of sea phase etc.).

On average, these firms produced about 11 200 tons fish in 2022, at an average price of EUR 8.4 per kg and at a production cost of EUR 7.45 per kg (OPEX + capital depreciation) before taxes and fees. The value of the real capital used for the production is assumed to be EUR 25 million.

3.1.1 Iceland – current system

The table below shows the key figures of the average producer. The producer will have a sales income of EUR 94 M, produced at a cost of EUR 83.4 M before taxes. The profit before taxes and other fees is at EUR 4.7 M.

As the profitability before taxes is relatively marginal, the corporate tax revenue is relatively low. In fact, because the production fee is a deductible expense, the tax revenue from the corporate tax is negative, which translates to a negative tax which can be deducted from future tax surpluses. The estimated tax value of the depreciation of capital exceeds is significant, at an estimated value of M 1.2 EUR. However, the other taxes and fees dominate this result. In particular, the production fee amounts to EUR 4 M, which nearly covers all the firms profits before taxes. The other aquaculture specific taxes are the environmental fee and the harbor fee, which total nearly EUR 1.4 M. The net result after taxes is that the firm generates a small profit when we include the tax value of depreciation and the negative corporate tax which can be carried forward. Thus, taxes and fees amount to about 87 % of the profit before taxes.

The production fee is the dominant contributor to the producers' share of taxes, constituting almost 100 % of the total value of taxes.[13]

---

[13] *As some of the taxes contribute negatively to the total level of taxation, the sum of taxes and fees that contribute positively to the result is higher than the total tax level.*

Table 4: Taxation of a generic Icelandic producer under the current system. Values in EUR.

Results		Iceland (current)
Sales income		94 080 000
Production costs		83 440 000
Profit before taxes and other fees		4 690 000
Corporate tax	-	145 120
Resource tax		-
Production fee		4 045 440
Other aquaculture specific taxes		1 370 159
Est. tax value of depreciation	-	1 190 000
Total taxes and fees		**4 080 480**
Net profit after taxes and fees		**609 520**
Taxes and fees as share of profit		87 %

Share of taxes and fees	
Corporate tax	-4 %
Production fee	99 %
Other aquaculture specific taxes	34 %
Est. tax value of depreciation	-29 %
	100 %

3.1.2 Iceland – proposed system

In the proposed system, there are two changes in taxes and fees.

The first change is the level of the production fee. The price of EUR 8.4 per kg falls into the 4th threshold, yielding a fee rate of 5.2 %. With the higher fee, the resulting profit is reduced correspondingly. The total fee is increased by roughly 20 % (mirroring the increase in fee rate from 4.3 % in the current system to 5.2 % in the new system), totaling nearly EUR 4.9 M and covering all the profits before taxes.

The second change is the fact that the production fee no longer is to be considered a deductible expense before calculation of corporate taxes. This translates to a higher corporate tax (which in fact is estimated to be negative under the current system). As a result, the corporate tax increases by more than EUR 1 million, which is a slightly larger increase than what we see in the production fee.

The other taxes and fees are left unchanged in the model.[14] The total effect of the proposed system is that the taxation increases substantially, by about 50 %. From EUR 4 million under the current system, the total tax bill

[14] Note that the tax proposal of the Icelandic authorities includes a change in the calculation of the Environmental fee. As all the necessary details of the proposal are not in place yet, we have not calculated the impact of this change.

increases to about EUR 6 million under the proposed system. Under the proposed system the taxes exceed the profits by about 28 %, yielding a net loss for the generic Icelandic producer.

Table 5: Taxation of a generic Icelandic producer under the proposed system. Values in EUR.

Results	Iceland (proposal)
Sales income	94 080 000
Production costs	83 440 000
Profit before taxes and other fees	4 690 000
Corporate tax	938 000
Resource tax	-
Production fee	4 892 160
Other aquaculture specific taxes	1 370 159
Est. tax value of depreciation -	1 190 000
Total taxes and fees	**6 010 319**
Net profit after taxes and fees -	**1 320 319**
Taxes and fees as share of profit	128 %

Share of taxes and fees	
Corporate tax	16 %
Production fee	81 %
Other aquaculture specific taxes	23 %
Est. tax value of depreciation	-20 %
	100 %

The relative impact of the two changes in the production fee (adjusted rates and change into nondeductible expense) depends on the result for a given firm each year. In the calculations for the average firm in 2022, they are equally important, accounting for 50 % of the tax increase each. In general, the change in production fee will matter more when prices increase, while the change in deductibility matters more when profits before taxes and fees are lower.

3.1.3 Summary

Under the current profitability levels of the Icelandic firms, the proposed tax system constitutes an increase in taxation for the firms. Under the current system, the generic producer generates a slight profit, while the firms on average generate a net loss after taxes and fees under the proposed system, given the 2022 profitability.

This result is driven by the increase in the fee rate and the fact that the system does not account for cost levels. As the Icelandic producers currently have a relatively low margin of profit, even slight increases in taxation can lead to a relatively substantial reduction in the firms' profitability. This result is enforced by no longer making the production fee deductible before calculating the corporate tax.

3.2 The tax systems given alternative profitability levels

In the previous section we looked at the static profitability of an average Icelandic producer given the 2022 results. Prices and costs will naturally vary between years. In this chapter we therefore model the results of the Icelandic tax system on a generic producer with three different profitability levels, and we also look at the results under the Norwegian and Faroese systems. We vary both prices and costs, as the models are sensitive to variations in both parameters.

3.2.1 Variations in profitability

We model production at a constant level of 20 000 tons HOG[15], which is somewhat higher than the current production level of the Icelandic producers, but close to the required production in the coming years given the forecast in the BCG report. This is also useful because it to a better degree illustrates the properties of the Norwegian model.[16] The value of the real capital used for the production is assumed to be EUR 45 million in all scenarios.

We start out with the modelled profitability of the generic Icelandic producer shown in section 3.1 and outline three scenarios:

- The first scenario is one where profitability increases slightly: we model an increase in prices of 10 % and decrease in costs of 5 %. This leads to a price and operating expenditure of respectively EUR 9,24 and 7,1 per kg.
- The second scenario is one where the profitability increases to a level comparable with the Norwegian producers. We model this as a case where the prices and costs are EUR 9,5 and 7,1 per kg, which gives a margin of profits around 25 %.
- The third scenario is one where the profitability falls from current levels. We model this as a decrease in prices by 10 % and an increase in costs by 5 %, yielding prices and costs of 7,64 and 7,84 respectively.

In the following sections we show the results for all scenarios in one tax model at a time, before we compare the results at the end. We include the case of Icelandic profitability in 2022 as presented in 3.1, but note that the results differ from those shown in section 3.1 as we increase the production to 20 000 tons, making the numbers with other tax systems comparable.

3.2.2 Iceland – current system

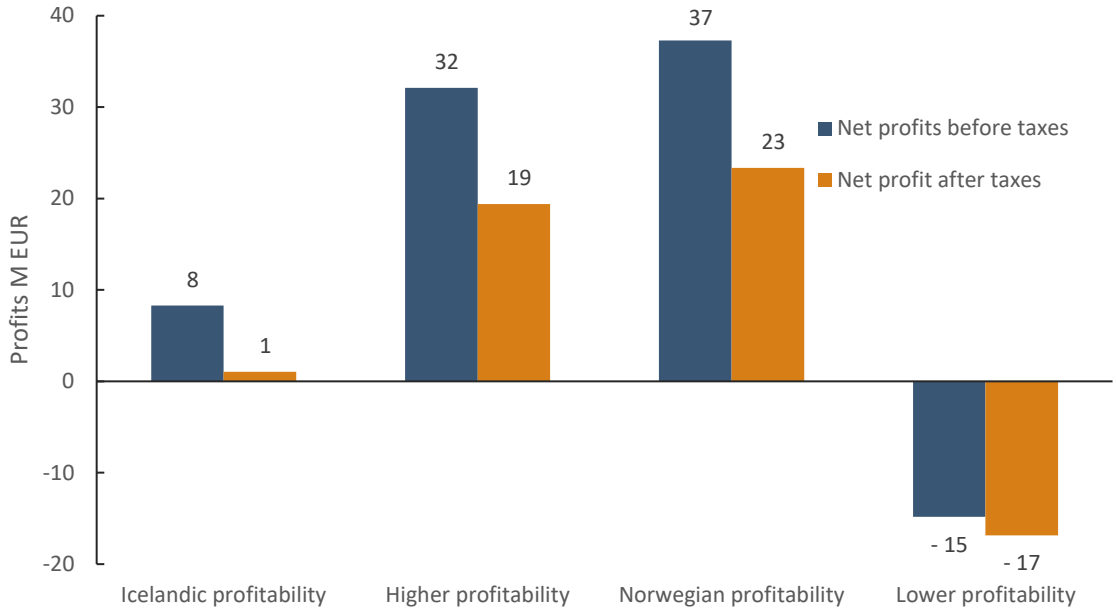
The profitability under the current Icelandic system is shown in the figure below.

---

[15] *Head on, gutted*

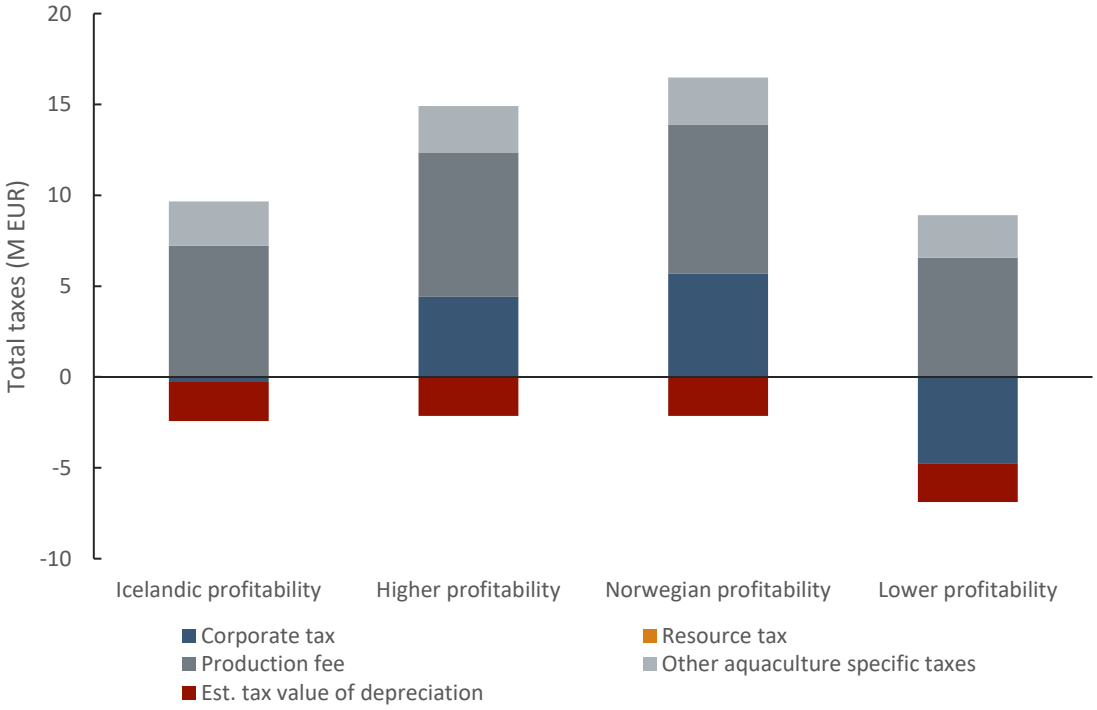
[16] *The minimum deduction of about EUR 6 million will constitute a rather large share of the profit under most circumstances for a smaller producer. When we increase the scale of the production, the relative importance of the minimum deduction is reduced, and the core properties of the tax model are shown more clearly.*

Figure 4: Profitability under the current Icelandic system



Under the current system, the tax level as a share of the profits varies greatly depending on the total level of profits. This result is driven by the fact that the production fee is relatively inflexible in terms of profits. Note that in the case of lower profitability, the loss after taxes decreases in spite of loss allowing for "carrying over" into future reductions in corporate taxation. This is because the production fee still applies and dominates the corporate tax effect. This is shown more clearly in the next figure, which breaks down the tax burden into individual components.

Figure 5: Composition of tax burden under the current Icelandic system

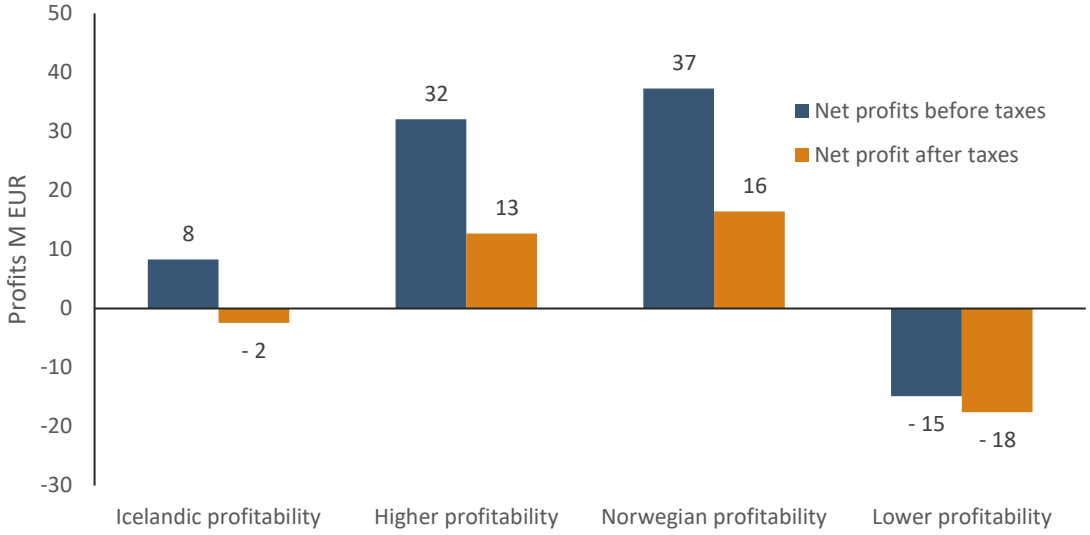


While the corporate tax varies greatly with profit levels, the production fee (and other taxes) is largely unchanged. While the production fee does fall with the prices, the burden of the production fee is heavier when the margin of profit is lower.

3.2.3 Iceland – proposed system

The profitability of the example producer under the proposed Icelandic system is shown in the figure below. The profile is quite similar to the current system (as seen in figure 4), but the profit after taxes is reduced in all scenarios.

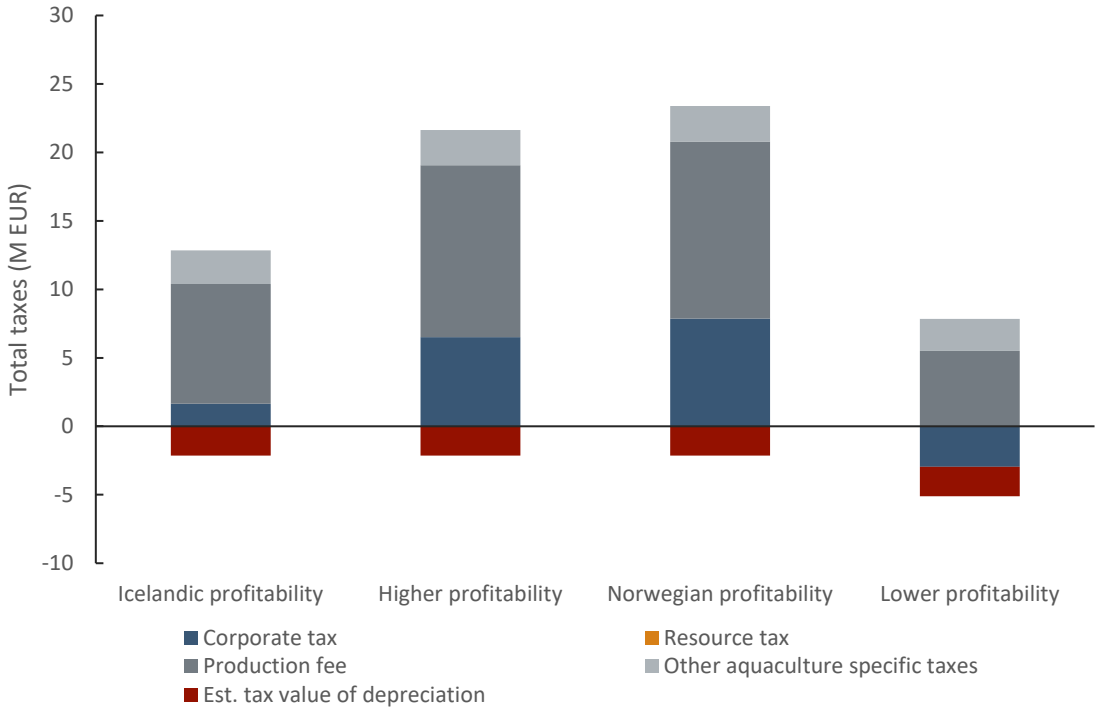
Figure 6: Profitability under the proposed Icelandic system



The driver behind this result is the production fee, which in particular increases in the cases where profitability increases. This can be seen more clearly in the figure below. When comparing with the result in figure 5, we can also see that the corporate tax in fact is higher than in the current system. This is because the production fee is no longer considered a deductible expense. In fact, we can see that even if the production fee in fact decreases in the case of lower profitability (due to the price falling to a threshold with a lower fee rate), the net loss after taxes is still slightly higher since the carryover effect for the corporate tax is reduced.

When compared to the taxes under the current system, the changed production fee contributes to 49 % of the tax increase in the first scenario, 63 % in the second and third scenario, while the change in deductibility contributes to the remaining 51/37 %. The proposed system would have decreased total taxation by 54 % in the fourth scenario, if not for the fact that the production fee is no longer considered deductible before taxes.

Figure 7: Composition of tax burden under the proposed Icelandic system

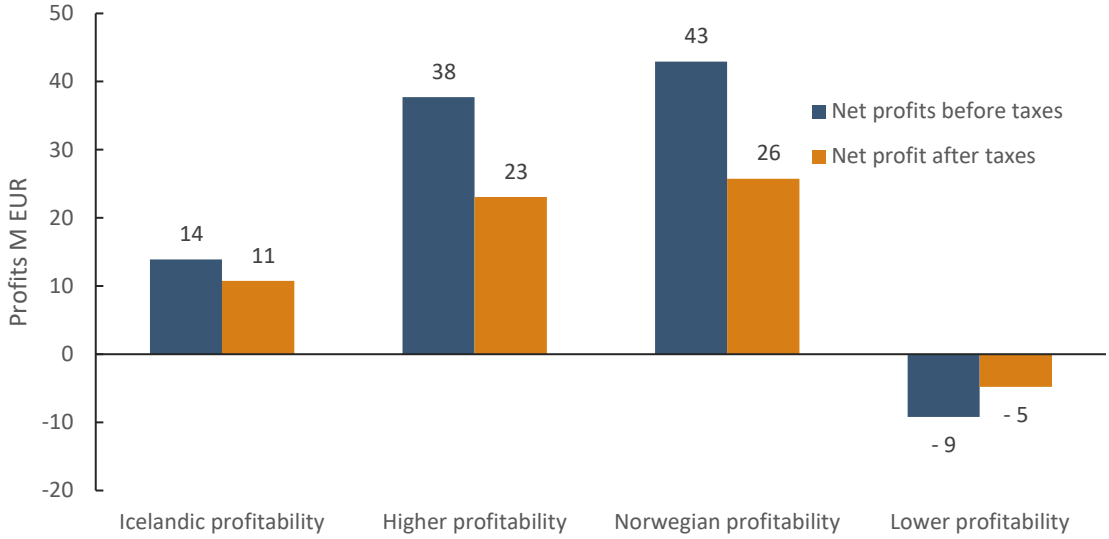


3.2.4 Norwegian tax system

The profitability of the example producer under the Norwegian system is shown in the figure below.[17] In this case the tax as a share of profits is less variable. This is mainly a result of the properties of the resource tax, which varies with the firm's profitability. Note that the firm's loss is lower in the low profitability scenario, as both the corporate tax and the resource tax contribute to lessening the burden. This effect is strictly speaking not immediate, but the losses can be carried over to following years and lead to a reduced taxation in profitable years, which is a benefit to the producer when their profits are negative.

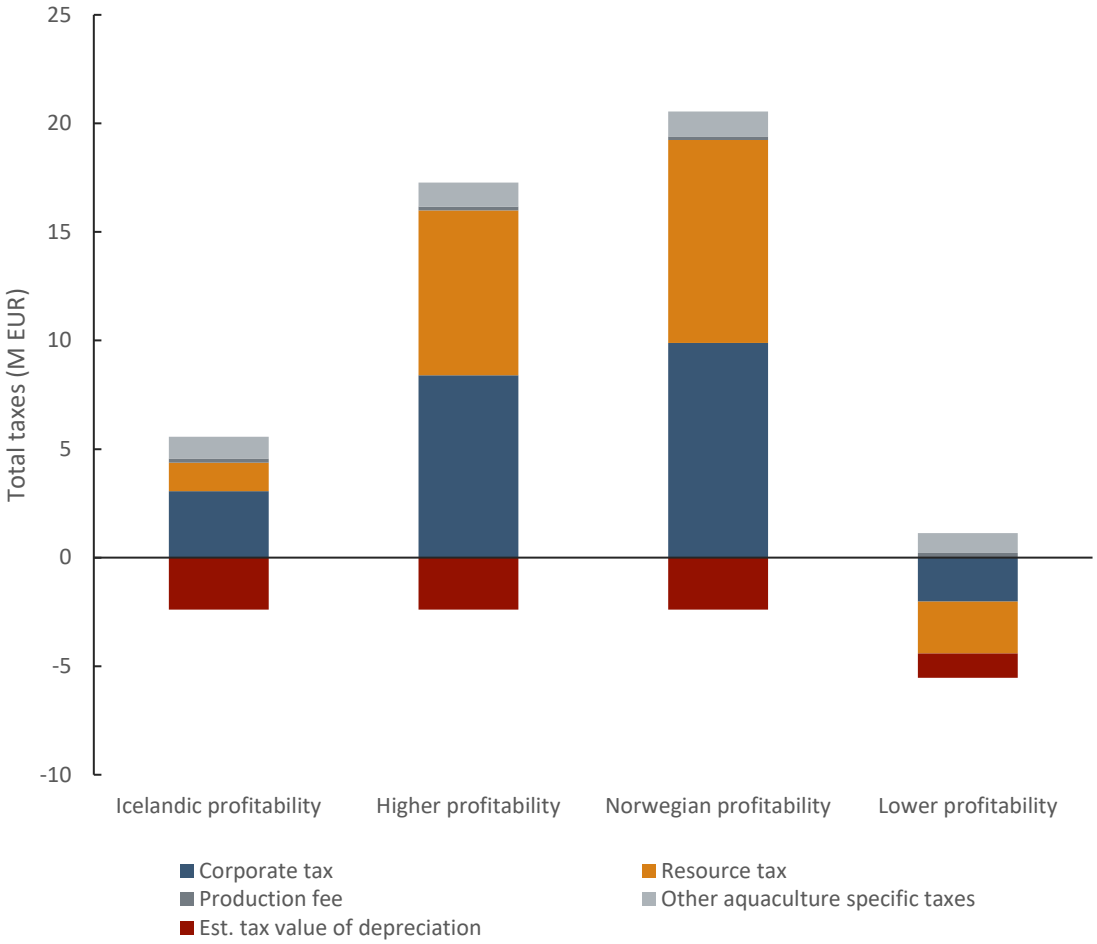
[17] *The profits before taxes are shown to higher than in the Icelandic case. This is a result of the depreciation rules which allow for a faster capital depreciation. While a higher depreciation of capital yields a reduced result in accounting terms in a given year, it is actually a relative tax benefit as the tax benefit of reduced corporate taxation yields a larger tax value of capital depreciation. In the Norwegian case this effect is somewhat reduced as the resource tax gives an increased tax benefit with respect to the depreciation of capital.*

Figure 8: Profitability under the Norwegian system



The figure below breaks down the composition of the tax burden under the Norwegian system. It should be noted that the resource tax is larger in the high profitable scenario and much lower in nominal and relative terms in the Icelandic profitability scenario. The fact that it is lower in relative terms is a result of the minimum deduction, which almost nullifies the resource tax in this case. In scenarios where the profitability is higher, the resource tax becomes more important.

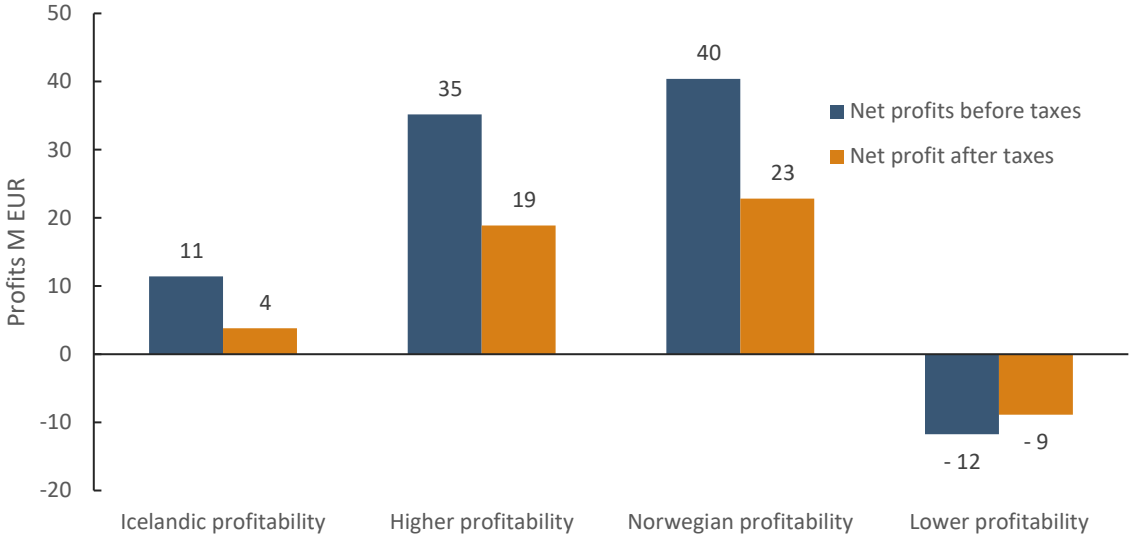
Figure 9: Composition of tax burden under the Norwegian system



3.2.5 Faroe Islands tax system

The profitability of the example producer under the Faroese system is shown in the figure below. As a hybrid model, the Faroese system also yields a result somewhere in the middle between the Icelandic and the Norwegian systems.

Figure 10: Profitability under the Faroese system



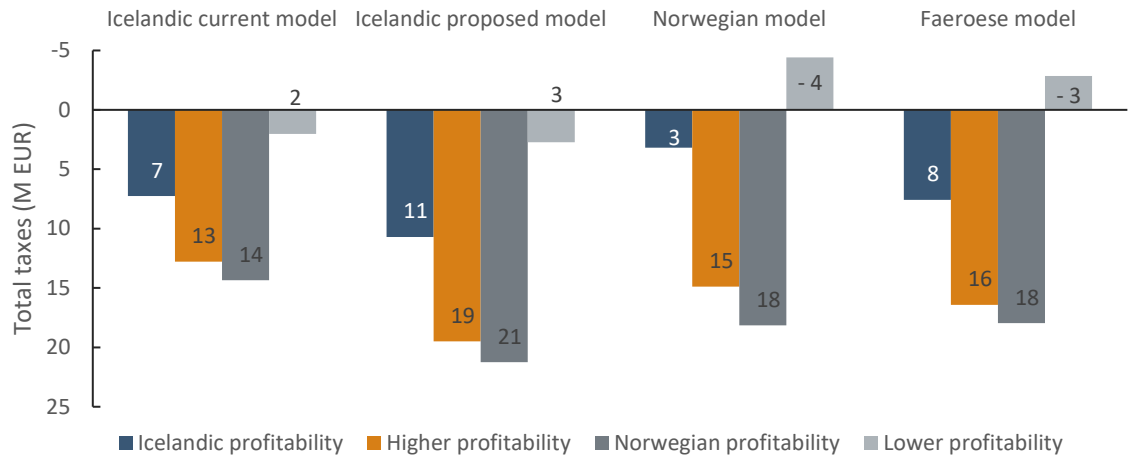
In our scenarios, the production fee varies quite symmetrically with the profitability. This is shown in the figure below which breaks down the composition of the tax. Note also that the production fee completely dominates the total taxation in the profitable scenarios. This is due to the combined fact that the fee is quite large in a profitable case, while it at the same time acts as a deductible expense which reduces the burden of the corporate tax. In a sense, the Faroese production fee acts as a partial replacement of their corporate tax.

Figure 11: Composition of tax burden under the Faroese system

3.2.6 Comparisons between countries

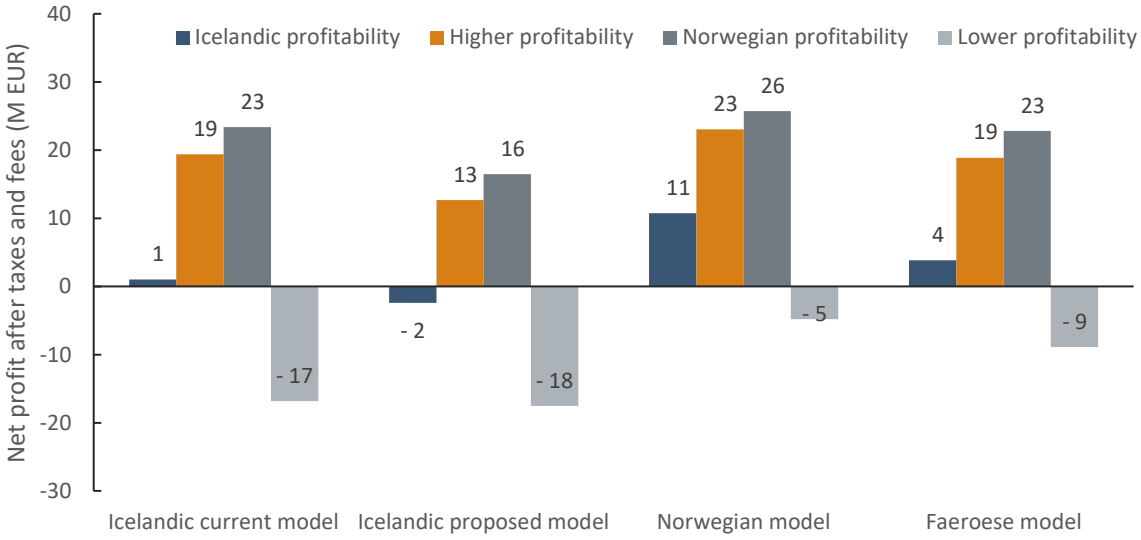
The producer has the same productivity in all instances, so the difference in the models can be expressed clearly by looking at the differences in total taxation. The figure below shows the total taxation under the four different cases under the four different tax systems we evaluate. The columns are grouped together by tax model, and the different profitability cases are represented by same-colored columns. Note that the Y-axis is inverted, and the scenarios with higher profitability yield higher taxes, represented by columns going further down.

Figure 12: Total taxes under the different taxation systems



The figure below shows the corresponding profits after taxes and fees in these scenarios.

Figure 13: Net profits after taxes and fees under the different taxation systems



The Icelandic model is to a much lesser extent than the Norwegian and Faroese model able to account for variation in profits. This follows because the most important tax in Iceland – the production fee – strictly varies with prices, and not costs or profits. This is the case with both the current and the proposed model, but the total taxation increases by a great deal in the proposed model in the base scenario and our 3 cases.

While the models fare similarly under the instances with higher/Norwegian profitability, the Icelandic model yields a significantly higher taxation in absolute and relative terms when the profit is lower.

Under current profitability, the proposed model turns a marginally profitable result into a negative result after taxes and fees. When we introduce a scenario with lower profitability, the proposed Icelandic model will worsen an already unprofitable situation for the producers.

These results imply that the Icelandic model, which is solely focused on the price of fish, seems particularly badly suited given the current profitability of Icelandic producers, which is lower than in Norway and Faroe Islands. The proposed model will in fact worsen the competitive conditions for the Icelandic farmers, as the unfortunate properties of the Icelandic model are enhanced with a relative increase in the tax fees. This result is enhanced by the proposal not to make the tax a deductible expense, which significantly worsens the tax burden when profitability is low.

An additional point is that we are implicitly modeling with a correspondence between the achieved price and the reference price that the tax rates are based on. It is far from certain that this will be the case. As shown in chapter 4, data from Kontali indicates that the price achieved for Icelandic salmon is consistently lower than the price of fish from Norway and the Faroe Islands. The Fish Pool Index, which is the proposed price reference, is based on Norwegian prices. Given the historical data, there is reason to expect a discrepancy between the reference price and the prices achieved by Icelandic breeders, to the further disadvantage of the Icelandic farmers.

3.3 Summary

In this chapter we have shown that the Icelandic producers have a relatively low level of profitability, and that the Icelandic tax model (both current and proposed) can become a relatively heavy burden as the tax does not vary with costs or profits. While the models result in quite similar outcomes when profitability is higher, the Icelandic model yields a significantly higher taxation when the profit is lower. As such, the Icelandic systems are not well-suited for situations where profits are low. This can be problematic when profits are relatively low, as is and has been the case for Iceland's aquaculture industry thus far.

Furthermore, the Icelandic model is unpredictable because the tax level to a large extent is a function of a global market price which producers cannot influence themselves. Both in the scenarios we have designed and analyzing the models using actual accounts of Icelandic firms, the proposed model represents a worsening of the tax burden for the Icelandic firms, who already have relatively low profits compared to Norwegian and Faroese fish farmers. The tax remains the same regardless of how profitable their operations are, but if they have low profitability, they may be incentivized to reduce production. This can in the worst case prevent the Icelandic industry from realizing the ambitions of growth that have been staked out.

4 Taxes and future Icelandic competitiveness

So far, we have explored the consequences of the newly proposed Icelandic tax regime for the aquaculture sector in Iceland, comparing the effects on industry profits and value added with alternative tax regimes based on the tax systems of Norway and the Faroe Islands. The next important question is how the tax systems affect the international competitiveness of Icelandic producers. If the effect is strong, one should expect a smaller marked share for Icelandic producers, potentially reducing the production volumes as a larger share of producers will experience deficits. Consequently, we turn our attention to the consequences of tax structures on international competitiveness. We start out mapping the potential effects of the alternative tax systems on competitiveness today.

How taxes affect the industry today is of strong interest, yet the aquaculture industry evolves rapidly as production and logistics technology develops further and market preferences change over time. Consequently, the tax system should also be reviewed in forward looking perspective. Do we have reason to expect that the new Icelandic tax system will propel the growth of the sector over the next ten years, or should we expect a negative effect on future production and value added? To answer this question, end this chapter discussion reasonable scenario for the evolution of competitiveness for Iceland over the coming years.

4.1 Present competitiveness

The international competitiveness of the Icelandic aquaculture industry is predominantly determined by three factors:

1. Production costs
2. Transportation costs to markets, including tariffs and non-tariff barriers.
3. The pricing power of Icelandic producers, signaling quality differences.

In this chapter, we explore the competitiveness of today comparing these three factors for average producers in the three countries: Iceland, Norway and the Faroe Islands.

4.1.1 Production costs per kg

In the table below we list production costs for one kilo HOG salmon, ready to be transported to market. Be aware that the costs reported through different sources are not directly comparable. This is commented on in the table, where we have subjectively adjusted for variations in definitions.

The figures show that average production costs are significantly higher in Iceland. This is the result of:

- Higher costs in the farming phase due longer production cycles.
- Higher costs in and the pre- and post- farming phases, probably due to a lack of scale economies. Compared to Norway, where pre-farming costs amounts to 10 percent of total costs, the pre farming costs in Iceland represent 15 percent of total costs, even though farming costs in the sea phase are also substantially higher. Post-farming costs represent almost 20 percent of total costs in Iceland, but only 10 percent in Norway.

Table 6: Production costs in Iceland, Norway and the Faroe Islands

	EUR/Kg	Comment on methods
Iceland	7	Based on accounts for 2022 for the three largest producers Adjusted downwards 0.5 EUR to fully exclude excess downstream costs
Norway	5.5	Based on the profitability study for 2022 conducted by the Norwegian Fisheries Directorate, covers close to all producers
Faroe Islands	5	Based on the annual 2022 report for Bakkafrost and estimates based on relevant data from Mowi Faroe Islands for 2022

4.1.2 Transportation costs and tariffs

A comparison between present logistics and transport prices in the three countries reveal significant differences. Shipment costs from Norway to the European markets are low and half the shipment costs from Iceland and the Faroe Islands. This is possibly due to the need for overseas shipping from Iceland and Faroe Islands to the European markets. Transportation cost to the US and Asia by air is also higher than in Norway. This is somewhat surprising since travel distance to the US is shorter from Reykjavik. However, larger transportation volumes may explain lower costs from Norway. In the Faroe Islands, a recently established direct shipment flight to the US has cut costs markedly. Hence, we estimate that the shipment costs now are lower from the Faroe Islands to the US than from Iceland.

Table 7:1 Transportation costs to market – EUR per kg (Source: Menon and market players)

	Iceland	Norway	Faroe Islands
Europe			
Ship/Truck	0,4	0,2	0,4
USA Ship	0,7	Na	Na
USA air	2,5	1,7	2,2
Asia air	2	1,7	2,7

In the table below, we report tariffs applied to imports of salmon from Iceland and Norway. We have not been able to identify relevant figures for Faroe Islands which are equivalent to the EU tariffs.

Table 8: Tariffs applied to salmon for sale in different markets (percent of export value)

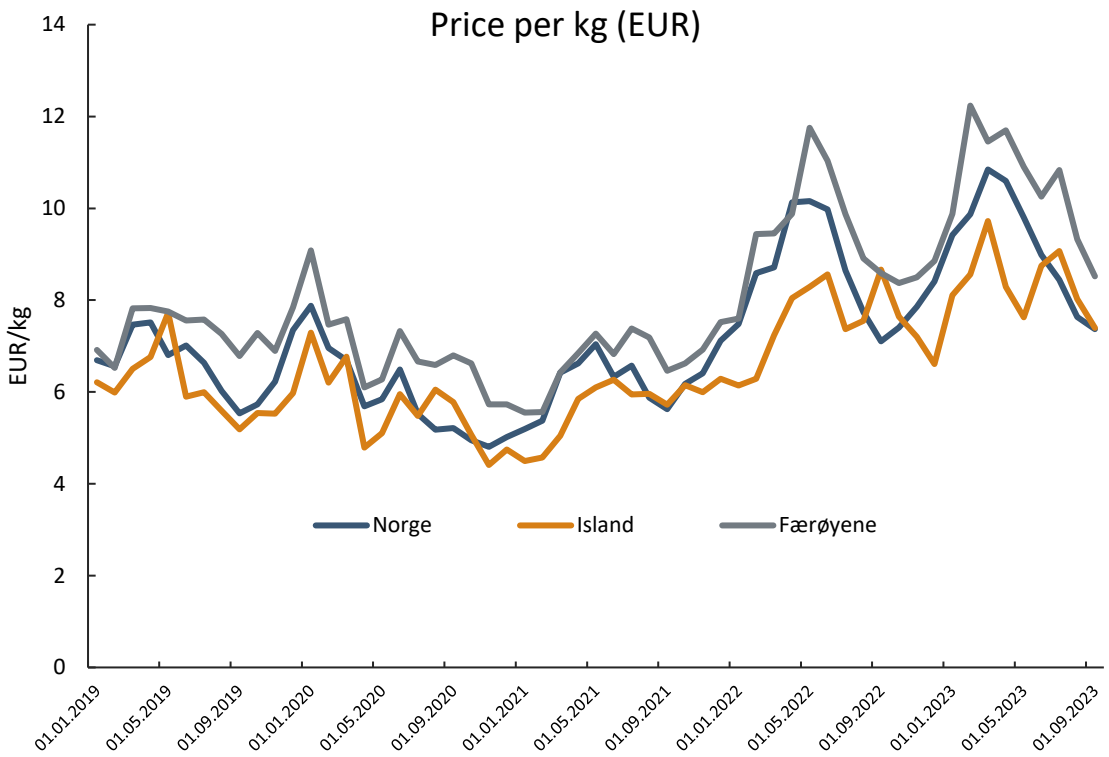
	Norway	Iceland	Comments
EU	2 %	2 % (toll free quota of 50 tons from 2024 as part of new EEA agreement)	According to EU TARIC
USA	0%	0%	US has bounded tariffs in WTO
China	10 %	0 %	Norge: MFN, IS: FTA
Japan	3,5 %	3,5 %	Assuming same tariff (MFN) since there is no FTAs

In general, the tariff rates applied are small. The largest difference is observed in the Chinese market where Norwegian salmon meets a tariff of 10 percent.

4.1.3 Sales price (perceived quality premium)

Sales prices vary significantly over time, but prices of salmon produced in the three countries are highly correlated. Since 2020, prices on salmon from all countries follow a clear positive trend. The price of Salmon from Iceland is systematically lower than the other prices. For 2022, we calculate a 4 percent lower price compared to Norway and a 10 percent lower price compared to the Faroe Islands. These differences are probably driven by the ability of producers to market their products more efficiently as quality products, or a product with more reliable delivery conditions.

Figure 14: Sales price for salmon HOG per kilo. Source: Kontali analyse



4.1.4 Competitiveness in Iceland with alternative tax systems

Having established variation in production costs, prices and transportation costs, we are now able to identify present differences in competitiveness under alternative tax regimes, based on an average producer in Iceland form 2022 (see chapter 3).

Table 9: Competitiveness (After tax profits, EUR per kilo) with alternative tax systems (2022 data)

	Iceland	Norway	Faroe Islands
Sales price	8.4	8.7	9.4
Production costs	7	5.5	5
Transportation costs (market weighted)	0.8	0.4	0.8
Tarrifs (market weighted)	0.168	0.261	0.094
Surplus	0.432	2.539	3.506
Surplus after taxes IC new	-1.06		
Surplus after taxes IC old	-0.89		
Surplus after Taxes Norway	-0.42	**1.36**	
Surplus after Taxes Faroe Islands	-0.75		**1.31**

In the table above, we report key cost and price figures in the upper panel. In the lower panel we report calculated surpluses/profits after tax, based on the four different model. Here we bring in the results from the model exercises in chapter 3. In addition, we report after tax profits for standard producers in Norway and the Faroe Islands, where actual tax systems are applied.

Taking transport costs into consideration, Icelandic producers are clearly less competitive than producers in Norway and the Faroe Islands. We can measure the change in competitiveness between alternative tax systems by considering the percentage change in surplus after tax from the (old) existing tax system. The new Icelandic model cuts Icelandic competitiveness by 7 percent compared to Norwegian producers that have the highest competitiveness. Using the Norwegian model in Iceland improves the competitiveness by no less than 20 percent, while applying the Faroe Island model improves the competitiveness by 5 precent.

We may sum up stating that the choice of tax model in the present state of the industry in Iceland will have a significant effect on international competitiveness.

4.2 Competitiveness towards 2035

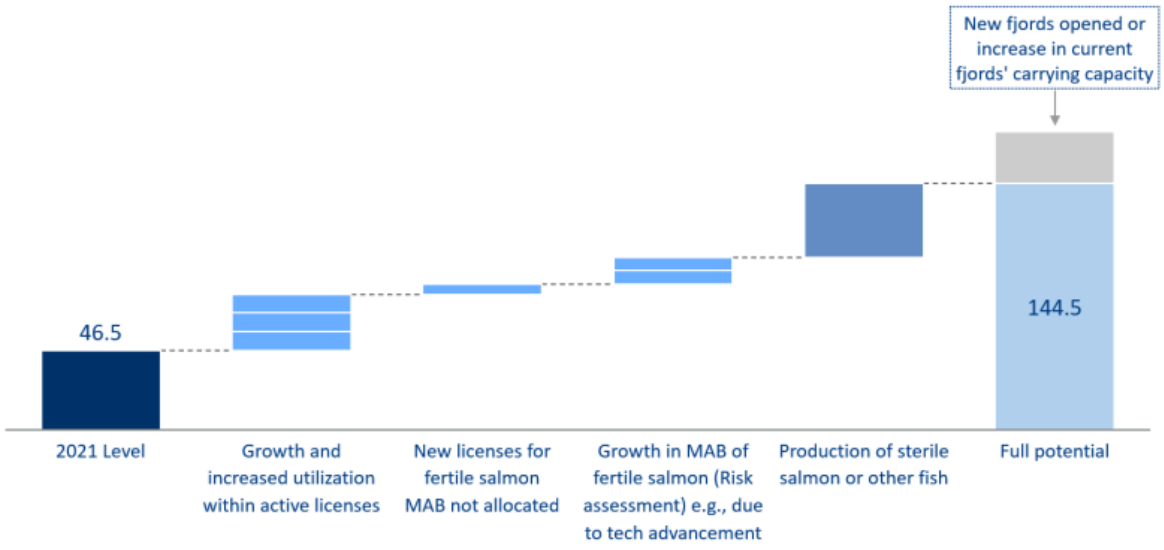
So far, we have focused on the present competitiveness, yet what draws the attention of the industry and the opinion in general is the future consequences of the tax system. In this section we outline some relevant scenarios for price and cost paths towards 2035.

4.2.1 Potential production volumes towards 2035

The potential for production volumes in Iceland in 2035 is partly determined by physical and environmental limitations and partly by profitability considerations, which again depends on the tax system.

BCG (2023) claims that The Marine and Freshwater Research Institute (MFRI) has calculated a maximum carrying capacity of 144.500 tons in the 10 fjords that have not been conserved to protect wild salmon stocks. MFRI points out that due to risk assessments, the maximum capacity in six of the fjords is even lower, capping the maximum allowed biomass capped at 106.500 tons today.

Figure 15: Production potential in Iceland: Source: BCG (2023)



The estimated full potential production combines potentials for improved utilization of existing licenses, enlarged MAB due to technological developments as well as higher potentials for other types of aquaculture. Also, BCG/MFRI considers a substantial potential for higher harvest volume by opening new production areas in three fjords not used for farming today.

Disregarding future prospects for onshore aquaculture production, we forecast a maximum offshore production capacity in 2035 of 150 000 tons, close to a tripling of the present production level. Notice though that scaling up to these levels will imply the mobilization of a substantial share of low productive units where production costs per kilo salmon are higher.

4.2.2 The evolution of costs and prices towards 2035

Forecasting future prices and costs is notoriously complicated. Historical figures show that the market price for salmon has grown 100 percent over the last ten year (2012-2022). In real terms (adjusting for CPI), the price growth is closer to 70 percent.

FAO predicts a steady growth in aquaculture seafood demand slightly above 2 percent per year towards 2032 (FAO/OECD 2023). This is partly driven by population growth and partly by an increasing share of the global population entering the middle- and high-income classes. There is reason to expect that demand for high priced seafood products may grow even faster as the income effect is stronger for such commodity groups. Since growth in global supply of salmon is expected to by moderate, one should expect prices to rise faster than the projections of FAO/OECD for salmon. We allow for alternative price paths, testing the effect of the tax model under alternative scenarios. As a lower growth estimate, we expect prices to grow by 50 percent in nominal terms in 2035. As a mid-alternative we prolong the price growth of the last ten years, implying a nominal price increase of 100 percent in 2035. A high price scenario is illustrated with a 150 percent nominal price growth towards 2035. Given a 3 percent inflation rate, real price growth is significantly lower (must be adjusted downwards by close to 40 percentage points over the period).

Experience during the last 15 years in Norway and Chile shows that production costs have grown faster than prices. In Norway, production costs per kilo have jumped 123 percent from 2012-2022. The main driver behind rising costs is health and environmental costs. Growth in feed costs follow the average cost growth, while hatchery and transportation costs display somewhat lower growth.

Looking ahead, one should expect that some of the cost components in Iceland will display a lower growth rate as the production volumes grow larger. There is reason to expect lower cost growth in the pre- and post-farming phases as economies of scale are utilized more extensively. We believe that costs per kilo related to hatchery and transport may grow at a lower rate.

Costs related to farming are expected to grow substantially as feed costs raise due to high global demand for soya and rape seed and corn. So far, we see no improvements in the health and welfare conditions in open pens in Iceland and expect such problems to become more costly in the years ahead, potentially reducing the survival rate over time.

As for prices, we model three cost scenarios. High-cost growth of 150 percent nominally towards 2035, mid-sized cost growth of 100 percent, and low-cost growth of 50 percent. Notice that cost increases over the period 2012 to 2022 in Norway amounted to 123 percent. Hence the high-cost scenario is close to the historical path in Norway.

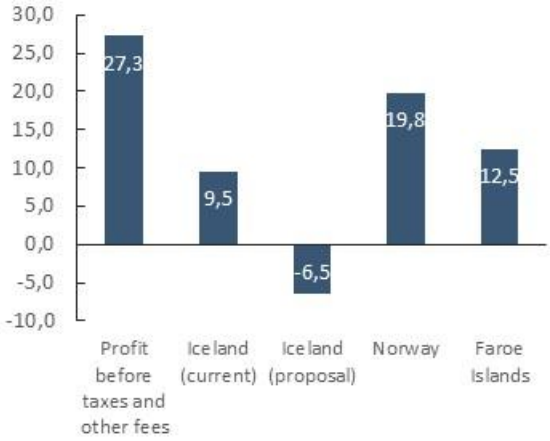
4.2.3 The new tax model in Iceland and effects on future revenues

By combining three price scenarios and three cost scenarios, we are able to model the consequences of applying the new tax model for Iceland compared to the three other models we have investigated.

Figure 16: Future profitability (Mill EUR) for an Icelandic producer, under alternative tax models in 2035

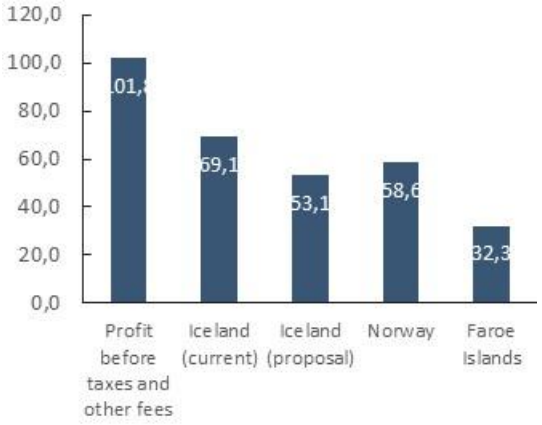
Symmetric:

100% growth in both prices and costs



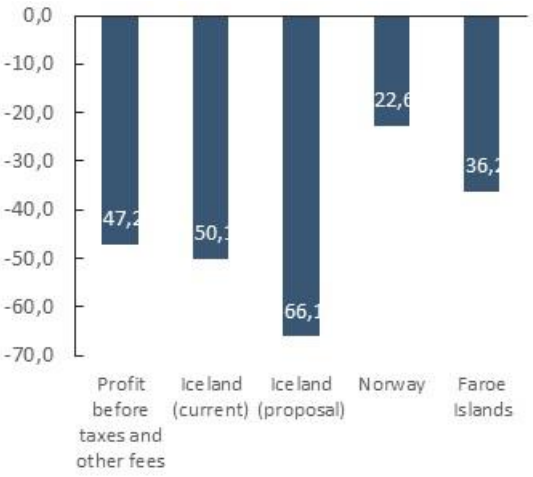
Double price growth:

Prices grow 100%, costs grow 50%



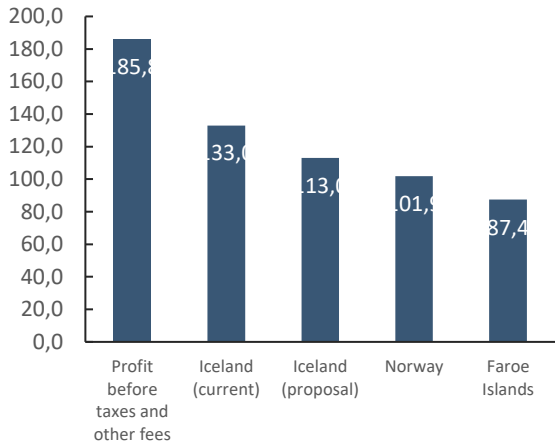
High cost case:

Prices grow 100%, costs grow 150%



High profitability case:

Prices grow 150%, costs grow 50%



In figure 16 above we line out profits for the average Icelandic firm in 2035 under the four tax regimes and without taxes. To illustrate how the regimes affect profits under alternative future projections, we present four graphs, based on distinctively different assumptions regarding price and costs growth.

The current Icelandic tax model generates higher profits to the producer in all cases, regardless of future price and cost growth trajectories. When prices and costs grow at the same rate, the proposed Iceland model proves least profitable after tax (upper right corner). The same is the case if costs grow significantly faster than prices

(left lower corner). If prices grow faster than costs, the proposed Icelandic model yields higher profits than the Faroe model. This is also the case when compared to the Norwegian model, but only if prices grow significantly faster than costs (lower right corner).

Which of these trajectories are most likely to occur?

Historical development reproduced: Lower left figure: The new Icelandic model is outperformed by the Norwegian and the Faroe Islands models, providing significantly higher tax costs and lower profits after tax. The Norwegian model is preferred.

Our best guess: The symmetric case, where cost growth is dampened somewhat towards 2035. This implies that the tax costs will be relatively similar in the new Icelandic model and the Norwegian model. This implies that after tax profits will be negative in Iceland in 2035 and that the proposed model yields the least profits of all models.

5 Conclusions

The Ministry of Fisheries in Iceland recently introduced a new draft bill on aquaculture. The draft bill contains a proposal on a revised production fee for aquaculture, affecting the aquaculture industry. In this report, we estimate the economic effects of alternative tax regimes on the aquaculture producers in Iceland, with a specific focus on the effects of recently the proposed draft bill.

The Icelandic producers of today have a relatively low level of profitability. The Icelandic tax model (both current and proposed) can become a relatively heavy burden as the tax does not vary with costs or profits. While the models result in quite similar outcomes if profitability is high, the Icelandic model yields a significantly higher taxation when the profit is lower. As such, the Icelandic systems are not well-suited for situations where profits are low. This is problematic when profits are relatively low, as is and has been the case for Iceland's aquaculture industry thus far.

Furthermore, the Icelandic model is unpredictable since the tax level to a large extent is a function of a global market price which producers cannot influence themselves. Both in the case of a representative Icelandic firm of 2022 and cases of firms with alternative productivity, the proposed tax model represents a worsening of the tax burden for the Icelandic firms. They already run relatively low profits compared to Norwegian and Faroese fish farmers today. Note that the tax remains the same regardless of how profitable their operations are. If they have low profitability, they may actually be incentivized to reduce production. This can in the worst case prevent the Icelandic industry from realizing the ambitions of growth that have been staked out.

These results imply that the Icelandic model, which is solely focused on the price of fish, seems particularly badly suited given the current profitability of Icelandic producers, which is lower than in Norway and Faroe Islands. The proposed model will in fact worsen the competitive conditions for the Icelandic farmers, as the unfortunate properties of the Icelandic model are enhanced with a relative increase in the tax fees. This result is enforced by the proposal *not* to make the tax a deductible expense, which significantly increases the tax burden when profitability is low.

The new Icelandic model cuts Icelandic competitiveness by 7 percent compared to Norwegian producers that have the highest competitiveness. Using the Norwegian model on Iceland improves the competitiveness by no less than 20 percent, while applying the Faroe Island model improves the competitiveness by 5 precent. We may sum up claiming that the choice of tax model in the present state of the industry in Iceland will have a significant effect on international competitiveness.

Looking into the future, we show that the current Icelandic tax model generates higher profits to the producer in 2035 than the proposed model in all cases, regardless of future price and cost growth trajectories. Our best guess is a trajectory towards 2035 with symmetric price and cost growth. This implies that the tax costs will be relatively similar in the proposed Icelandic model and the Norwegian model. Notice though, that after tax profits will be negative in Iceland in 2035 and that the proposed model yields the least profits of all models. In this case aquaculture in Iceland will by unprofitable in 2035.

List of references

Bakkafrost Annual Report (2022)

BCG - Björnsson, B., Perez, D., Martinsen, S., Langhorn, M. P., Koralewicz, A., Olsen, G., Vedeler, H., Schack, L., Muedano, S., Thorup, S., & Julegaard, V. (2023). The state and future of aquaculture in Iceland. Government of Iceland - Ministry of Food, Agriculture and Fisheries

Det kongelige Finansdepartement (2023) Prop. 78 LS - Grunnrenteskatt på havbruk.

The Icelandic Ministry of Fisheries (2023) Draft bill on Aquaculture: https://samradsgatt.island.is/oll-mal/$Cases/Details/?id=3625 *[Downloaded 21.12.2023]*

Erlendsson, M. & Pálsson, G. (2021) Greining á áhrifum fiskeldis á Vestfjörðum. KPMG

OECD/FAO (2023), OECD-FAO Agricultural Outlook 2023-2032, OECD Publishing, Paris, https://doi.org/10.1787/08801ab7-en.

Grønvik, O. & Aslesen, S (2022). Skatt og verdiskaping i oppdrett. Menon publikasjon nr 153/2022

Guðmundsson, Á. (2023). Aquaculture tax comparison: A three-country study. KPMG

KPMG Law (2022): The taxation of aquaculture 2022, KPMG

MOWI Integrated Annual Report (2022)

Ulltveit-Moe, K. Andvord, G. B., Armstrong, C. W., Christiansen, V., Fossli, G., Haugen, O. L., Moen, H., Noss, A., & Nøstbakken, L. (2019). NOU 2019: 18 Skattlegging av havbruksvirksomhet.

Menon Economics analyserer økonomiske problemstillinger og gir råd til bedrifter, organisasjoner og myndigheter. Vi er et medarbeidereiet konsulentselskap som opererer i grenseflatene mellom økonomi, politikk og marked. Menon kombinerer samfunns- og bedriftsøkonomisk kompetanse innenfor fagfelt som samfunnsøkonomisk lønnsomhet, verdsetting, nærings- og konkurranseøkonomi, strategi, finans og organisasjonsdesign. Vi benytter forskningsbaserte metoder i våre analyser og jobber tett med ledende akademiske miljøer innenfor de fleste fagfelt. Alle offentlige rapporter fra Menon er tilgjengelige på vår hjemmeside www.menon.no.

+47 909 90 102 | post@menon.no | Sørkedalsveien 10 B, 0369 Oslo | menon.no