Development of the Icelandic Value Chain

Value Chain course for Senior Fisheries Officers in the CRFM States

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Structure of the presentation

- Icelandic fishing
- Development of Icelandic value chain
- Influencing factor on the development
- Summary

Iceland

Population – 331.918 (2015)

- Capital area counts for around 70% of the population in Iceland
- Suriname 579,633 (2015 est)

Size 103,000 sq km

- Surinam 163.821 sq km

GDP - per capita (PPP):

- Iceland $46,100 (2015 est.) country comparison to the world: 30
- Suriname $16,300 (2015 est.)

Icelandic fishing zone

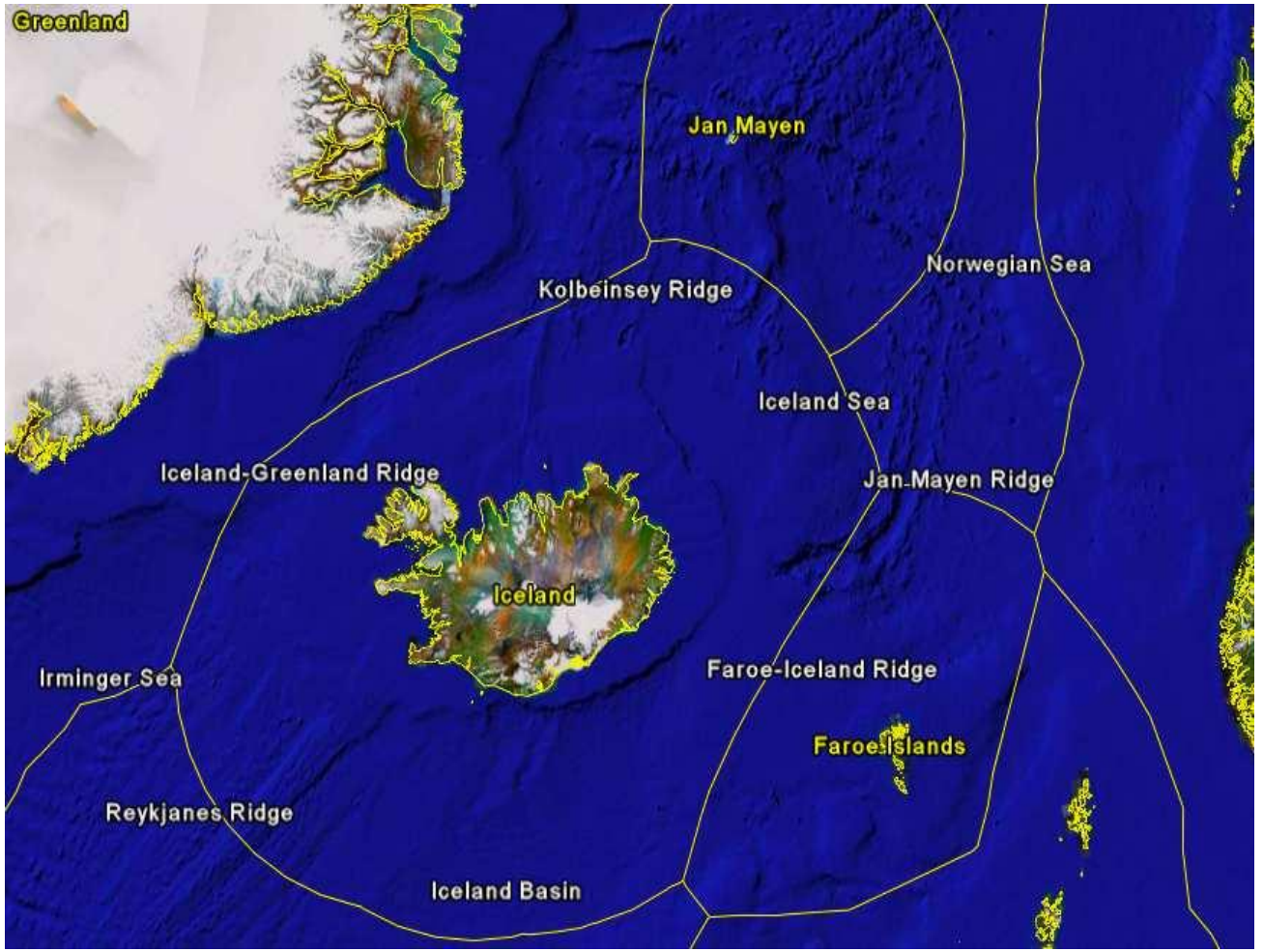
Iceland's exclusive fisheries zone has an area of 760,000 square kilometers, seven times the area of Iceland itself

The Icelandic government increased the Icelandic fisheries' limits during the period 1952-75

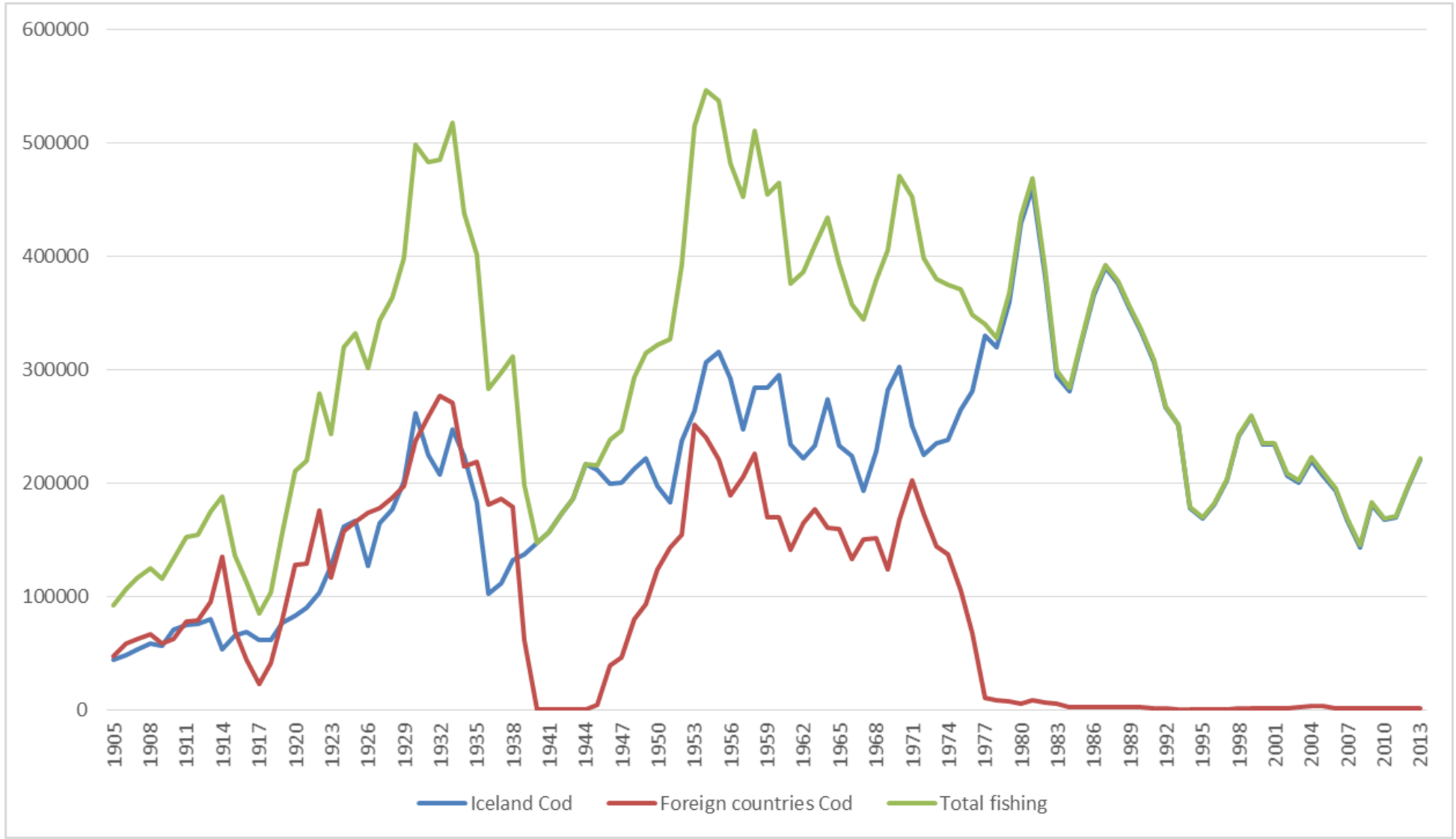
- 12 Nm 1958
- 50 Nm 1972
- 200 Nm 1975

In 1983 when quotas were placed on the catches of the most important species

In 1990, when quotas were put on all species and boats and individual transferable quotas were introduced on all major species.

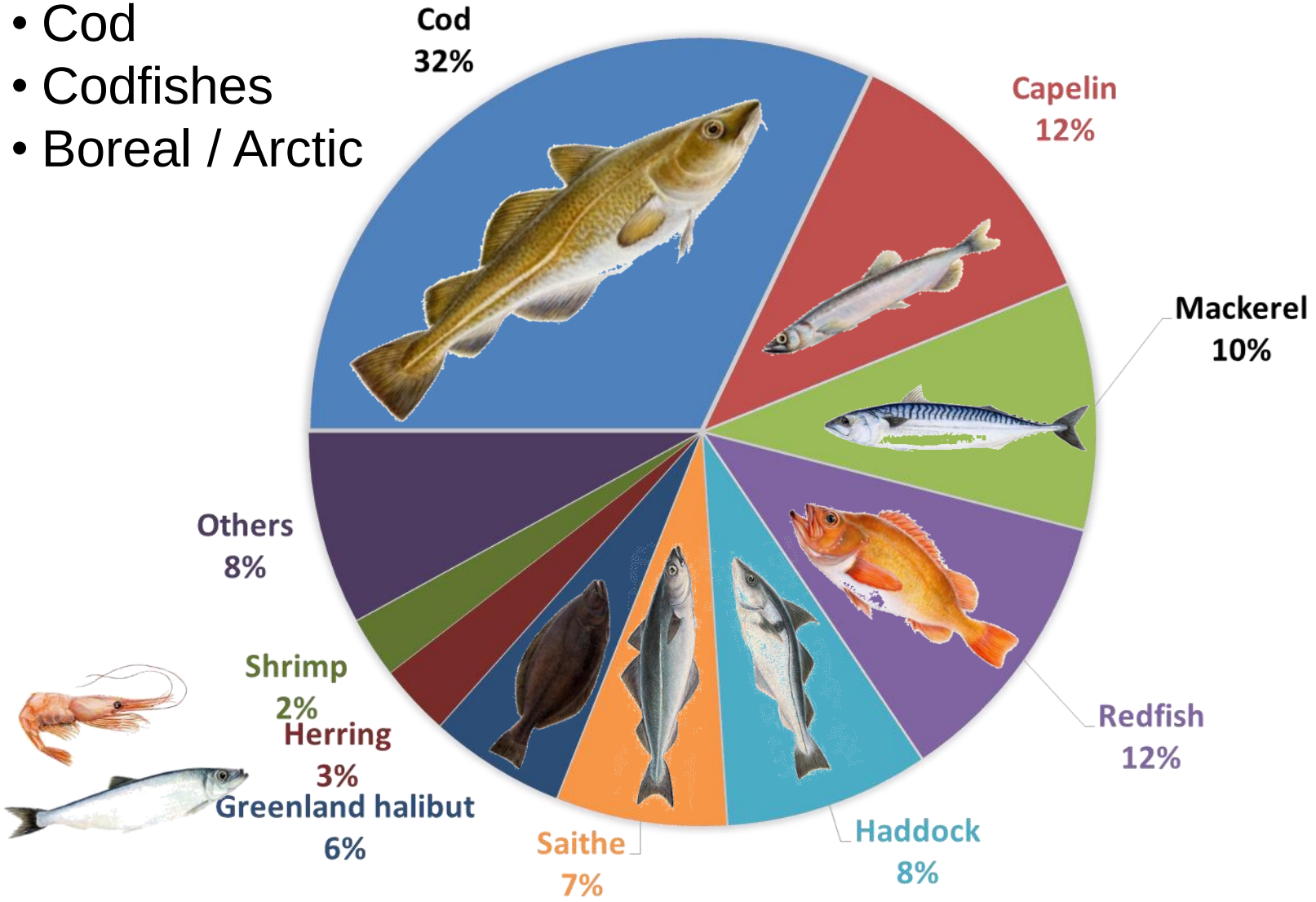


Catch of Cod in Icelandic waters 1905-2013



CATCH VALUE IN 2013

- Cod
- Codfishes
- Boreal / Arctic

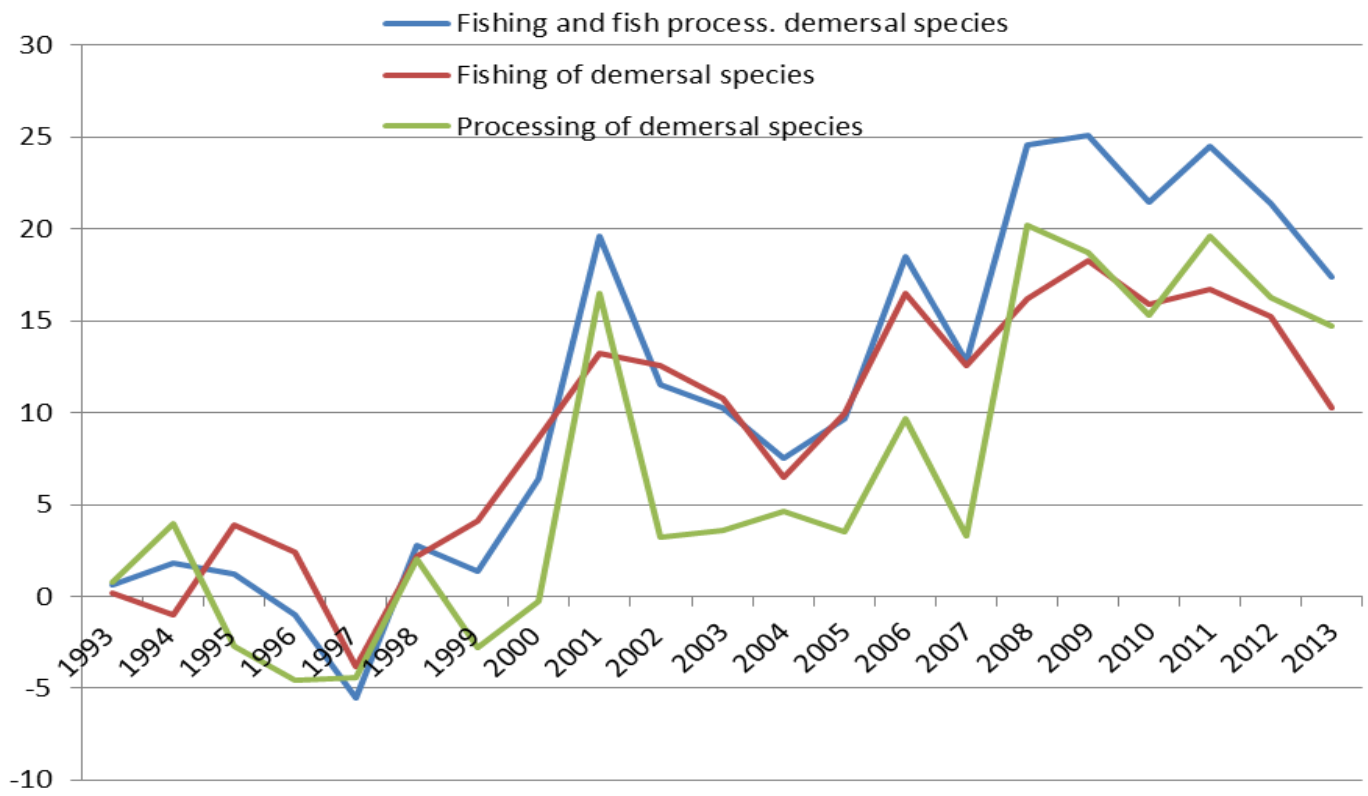


Development in Icelandic fish industry

Icelandic story

- No domestic markets “Export or die”
- High degree of vertical integrated companies (fishing, processing and marketing)
- Mainly small and medium size companies (SMEs) 10 – 300 employees
- Two large international marketing companies with secondary processing abroad
- Few traditional fishing companies with operation in countries outside Iceland
- Today the Icelandic fish industry is a high tech innovative industry and one of the most profitable fishing industries in the world…
- …it has not always been this way.....

Net profit in fishing and fish processing, 1993-2013



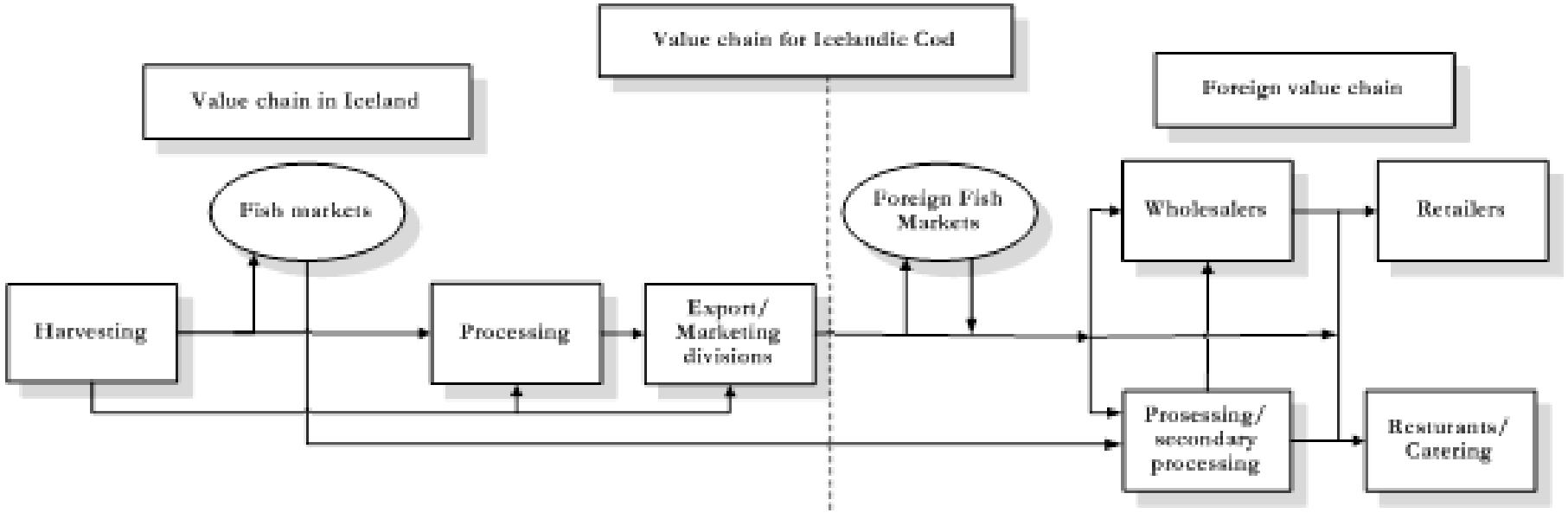
CHALLENGE OF THE ´90

- Export from Iceland was restricted by monopoly and duopoly until mid-1990
  - Three sale and marketing organisations (SMO) were the main players in fish/seafood export from Iceland
- Conflict of interest in value creation
  - Primary processing in Iceland versus secondary processing abroad
- Lack of marketing connection and information downstream and upstream
  - Information pre-cooked and information flow was ruled by SMO´s
- High percent of production went into low value bulk production for further processing
- Strategy of previous decades had been on solve all problems with more quantity that is increase numbers of fishing vessel/trawlers

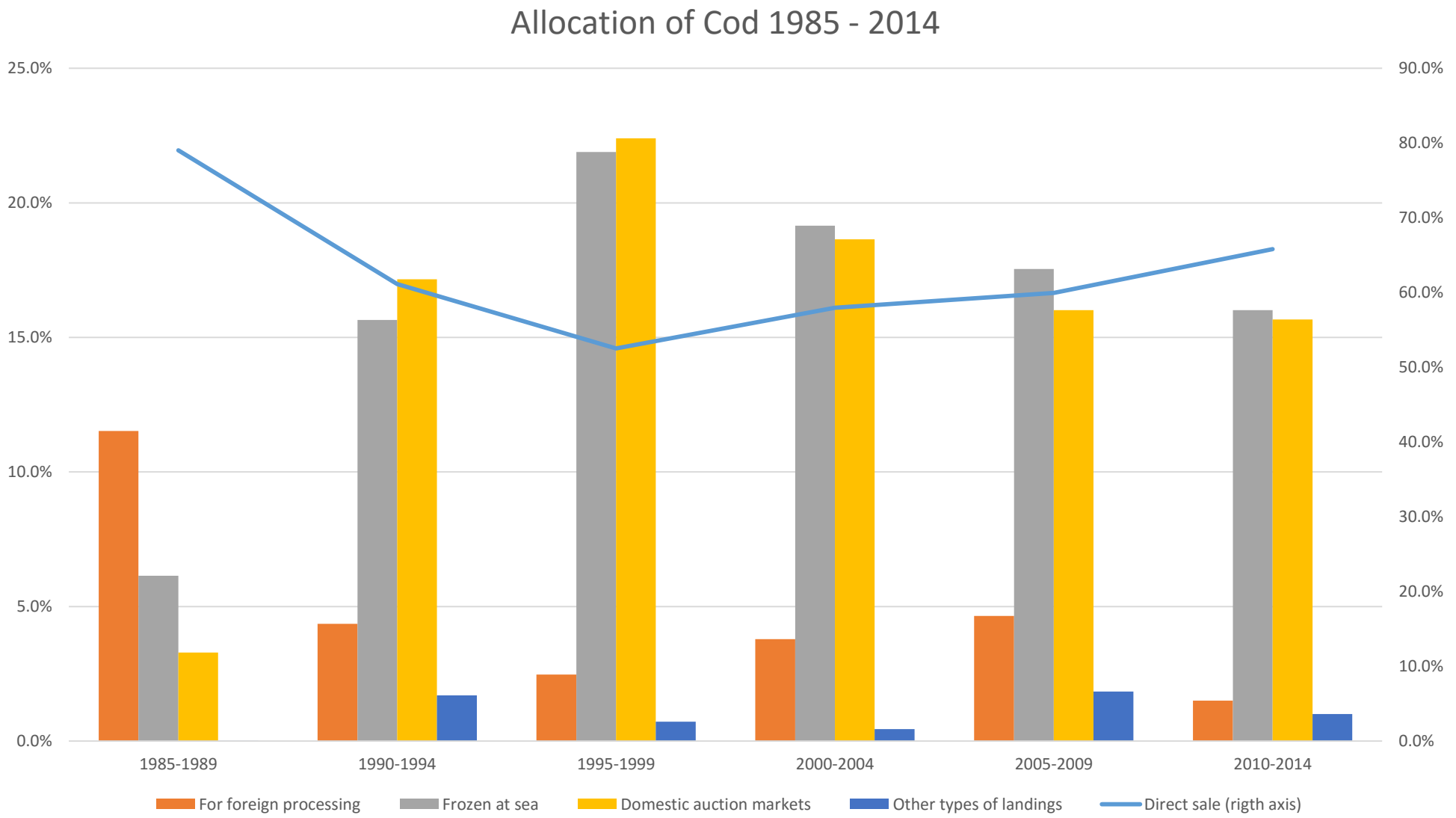
Quantity driven value chain

Modes of Exchange

- In Iceland the exchange of wet fish is dominated by three modes of exchange:
  - Auction sales (fish markets)
  - Fish sourced from own vessels (vertically integrated fisheries companies, VICs)
  - Direct sales contracts between fishing vessels and processors

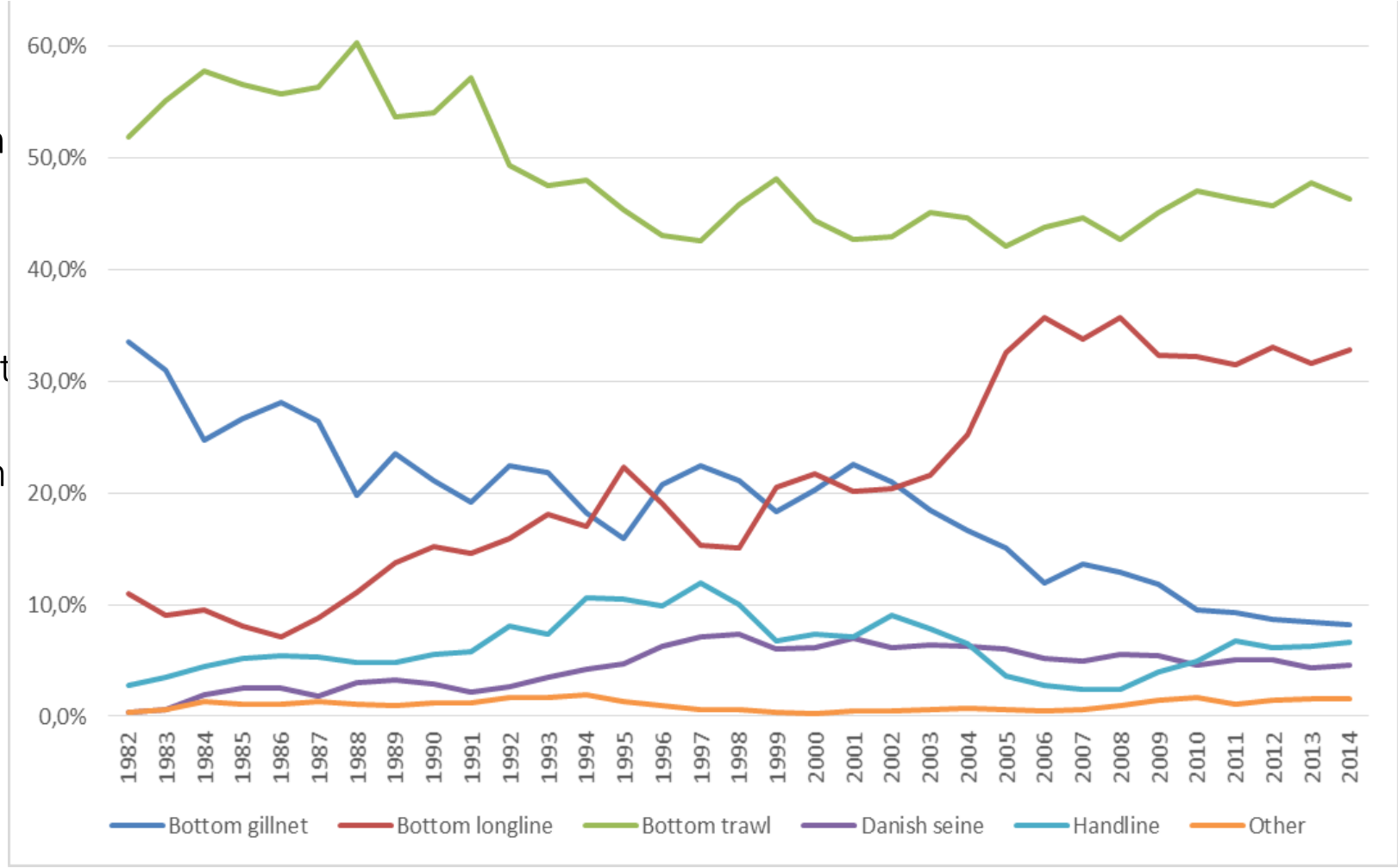


Allocation of Cod 1985 - 2014



Fishing Gear

- The fishing gear that catches the highest value is the bottom trawl with 40%-50% of the value of the total catch. The second most valuable catch is from longlines.
- It is interesting to the decline in gillnet fishing or from around 45% of the total Cod catch in 1982 down to 9% in 2014.
- This hold in hands with the increased use of longline or from being around 10% in the 1982 to become over 30% in 2014.

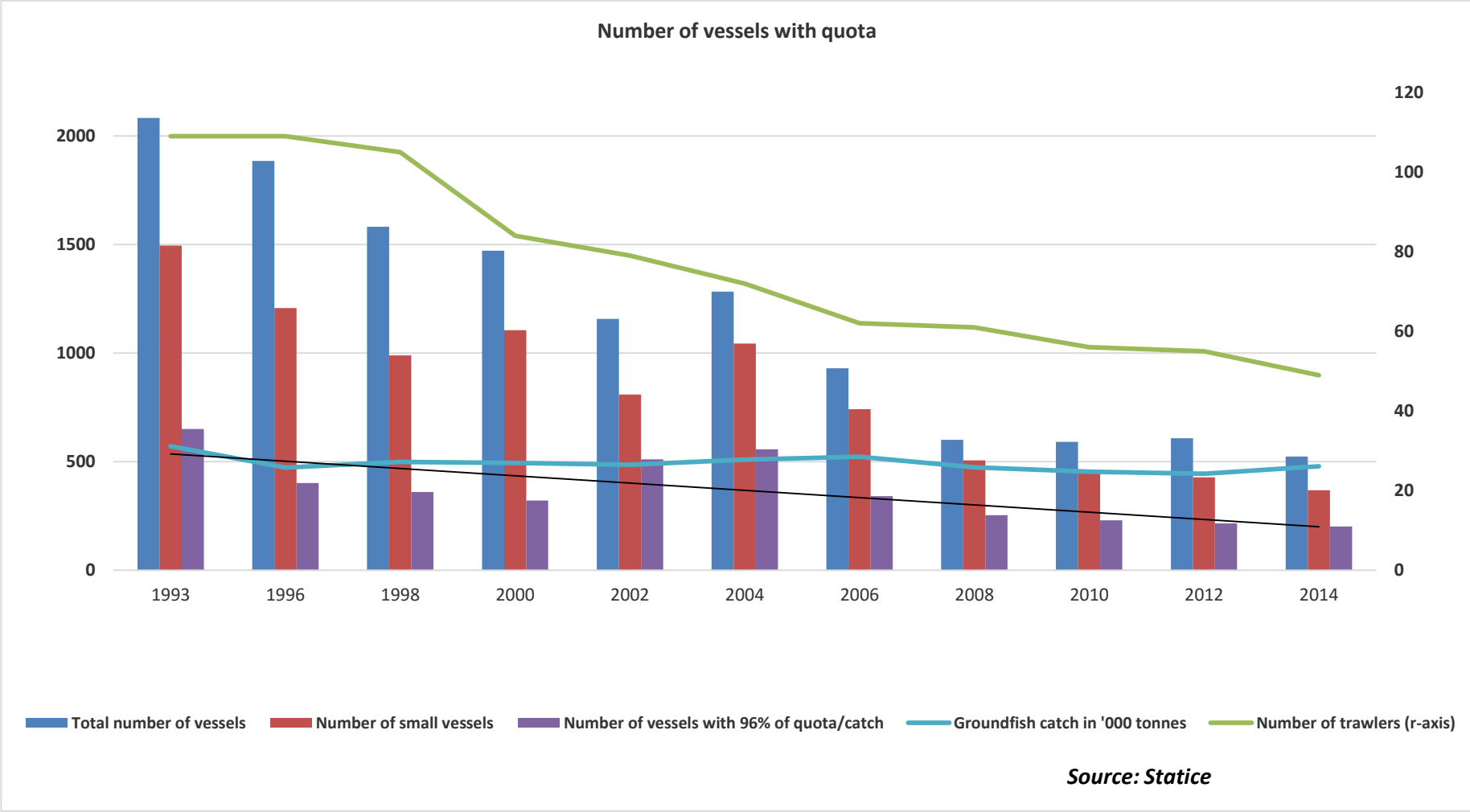


Consolidation of the fleet

Between early 1990s and 2014

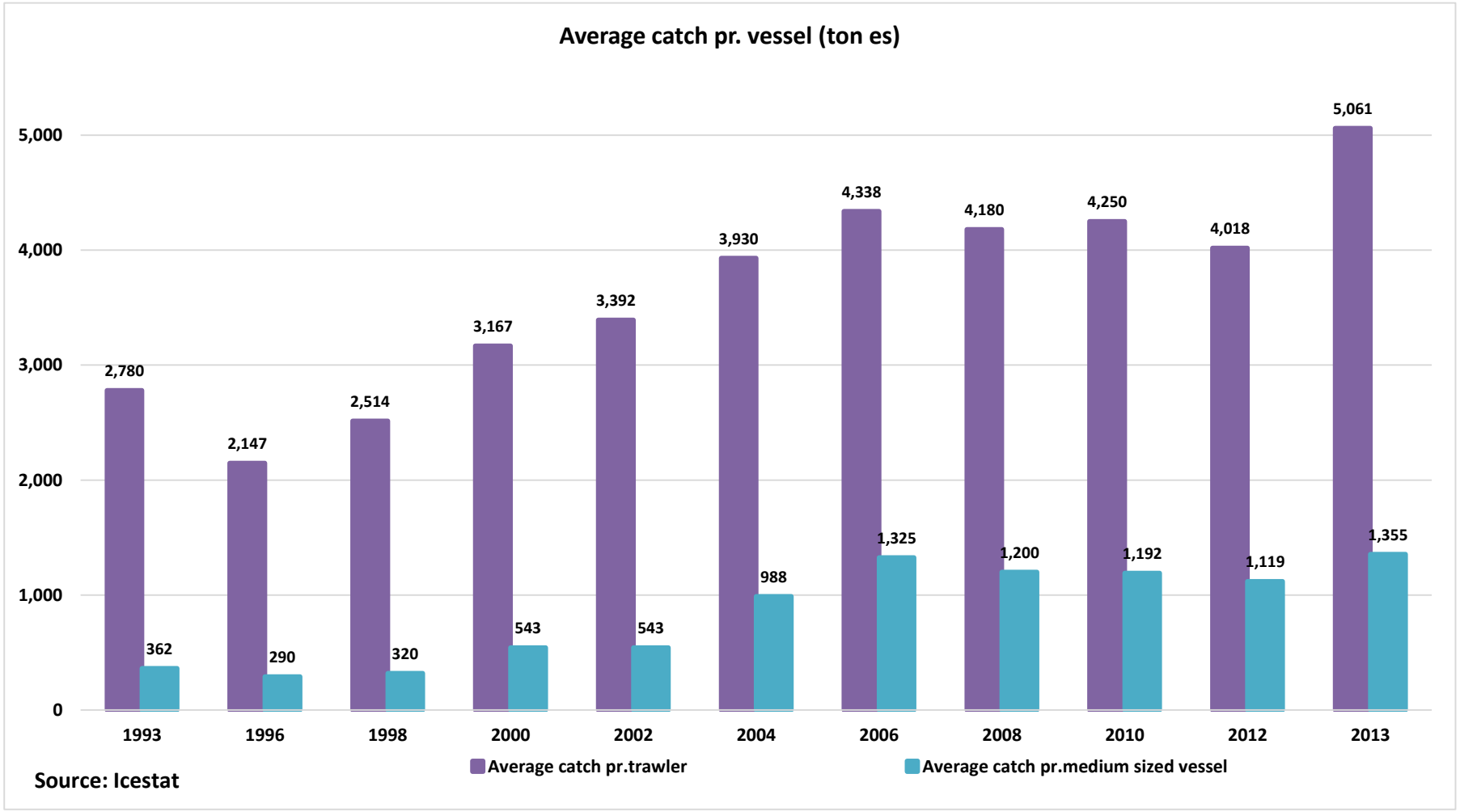
Number of all vessels fell by 60%

- Trawlers by half
- Medium sized vessels by three-fourth



Consolidation of the fleet

- Average catch pr. trawler was more than twice higher in 2010-13 than in the 1900s
- And in the category of medium size vessel, the average catch was nearly three times larger in 2013 than in the 90s



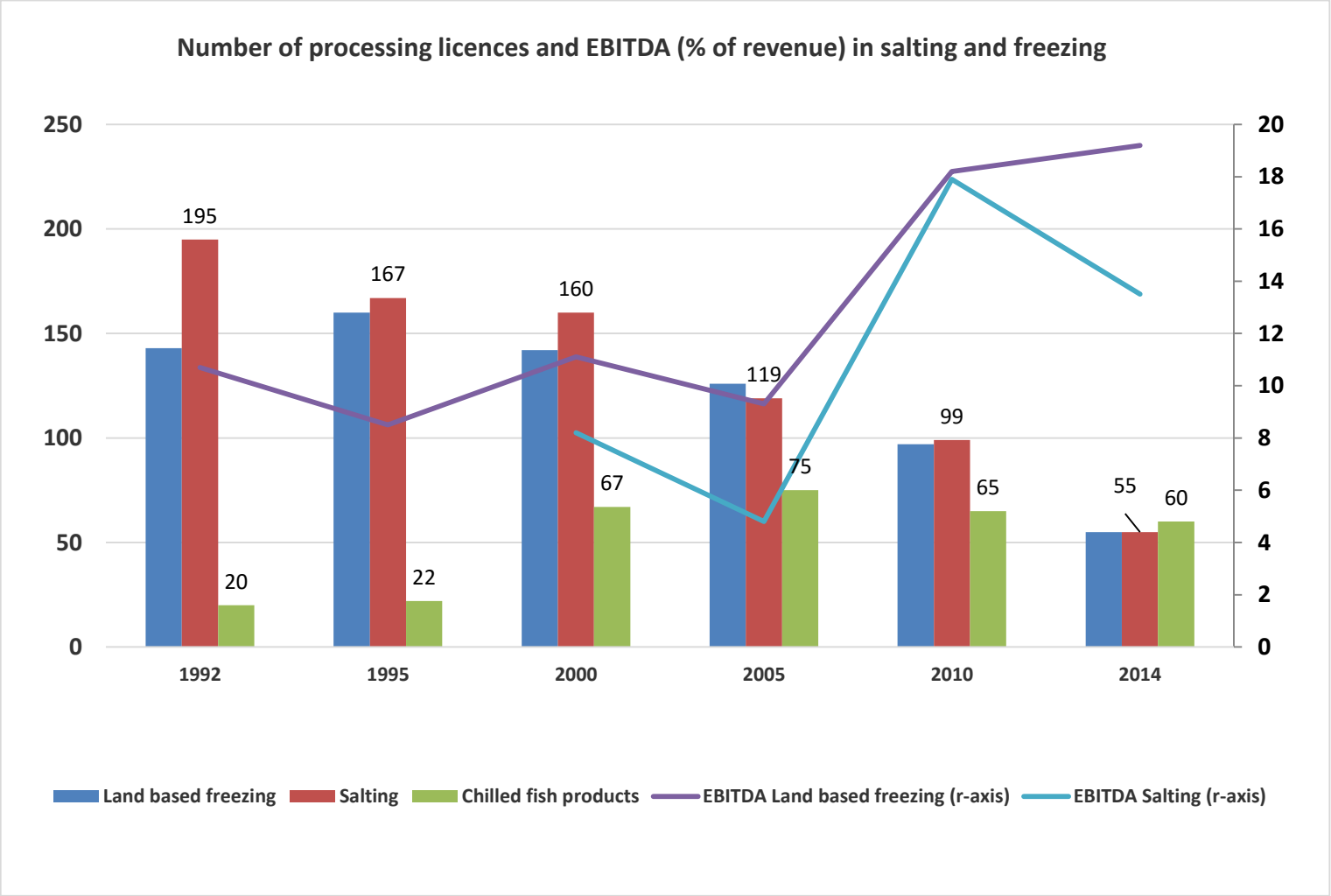
Processing Trawlers

Around 2000, the number of Freeze trawlers with processing facilities was 36, but currently there are only 14 left.

- Fresh fetching better prices.
- Better utilization of the fish
- The increased quota from the Barents Sea has let to price reduction in frozen cod. Number of these trawlers have therefore been sold to Russia.
- The salary on the freeze trawlers are high and therefore a major factor in these changes in the Icelandic fleet.

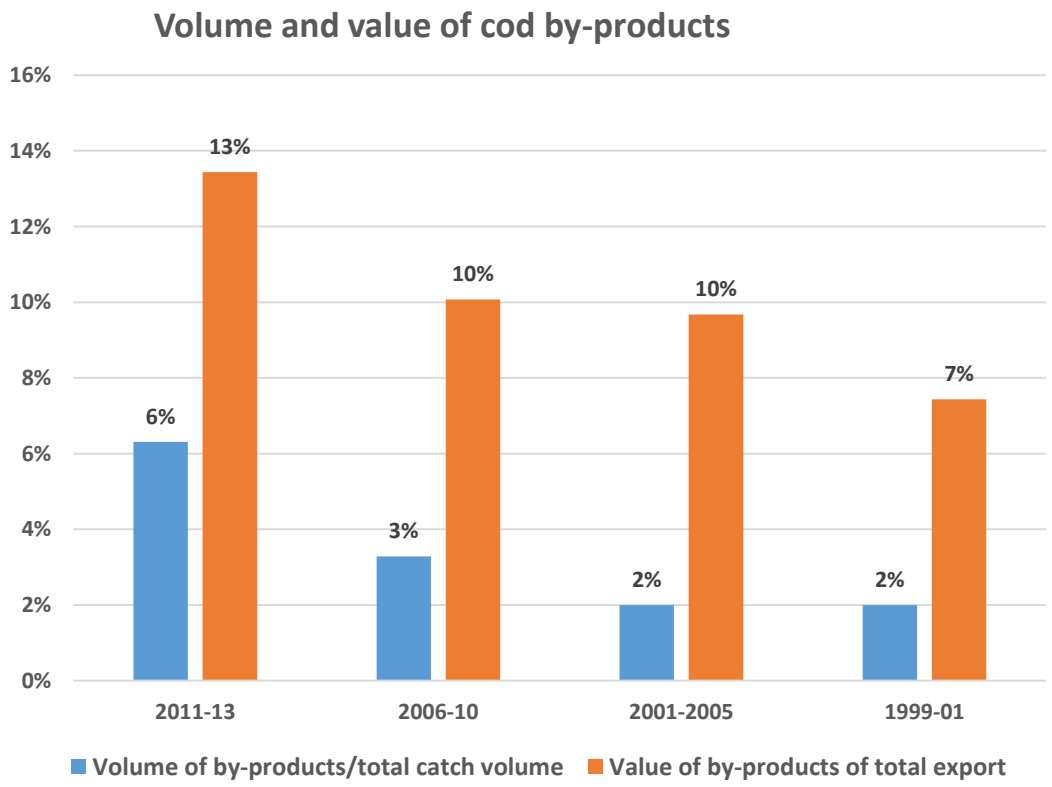
Consolidation in fish processing to fewer and larger plants

- In early 1990s over 400 processing plants (licences)
- Now they are under 200
- Saltfish processors declined by three-fourth
- Land based freezing by 60%
- FAS (freezer trawler) from 36 in mid-1990s down to 14 in 2014
- But large increase in the number of fresh fish processing plants
- Not only the number of processing plants has declined, but relatively more in small and medium sized plants
- Remaining plants on average larger than before
- And operating profit up

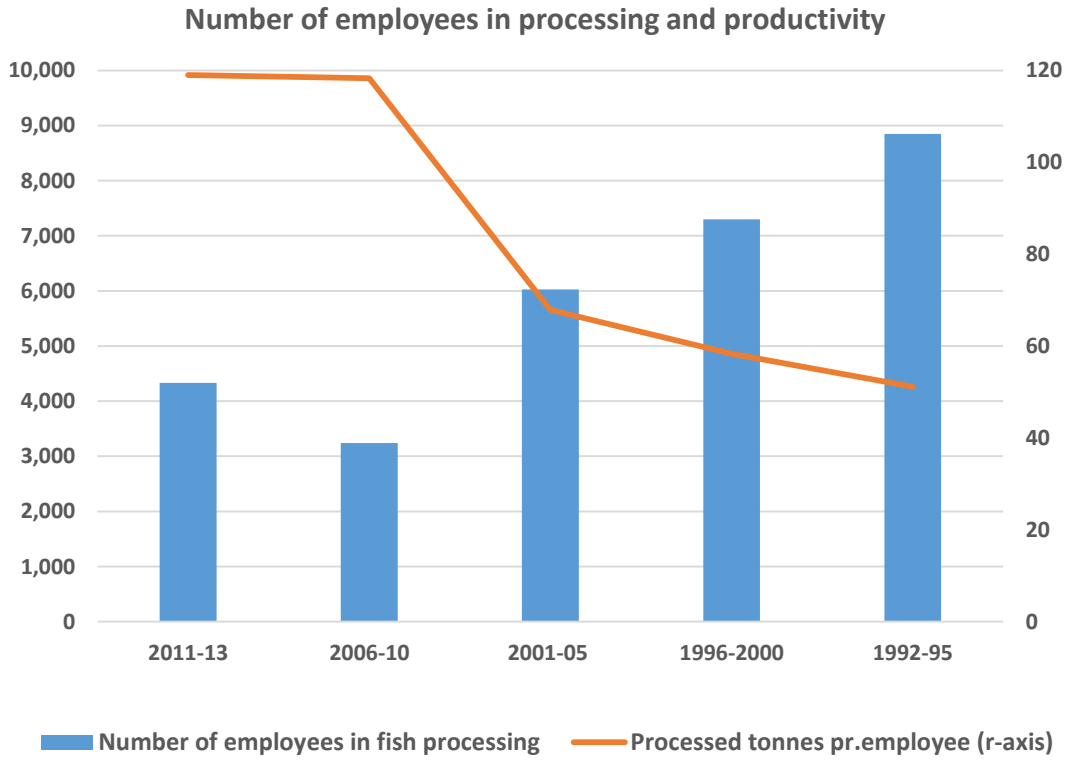


Productivity is increasing and higher product value

Increasing value of by-products

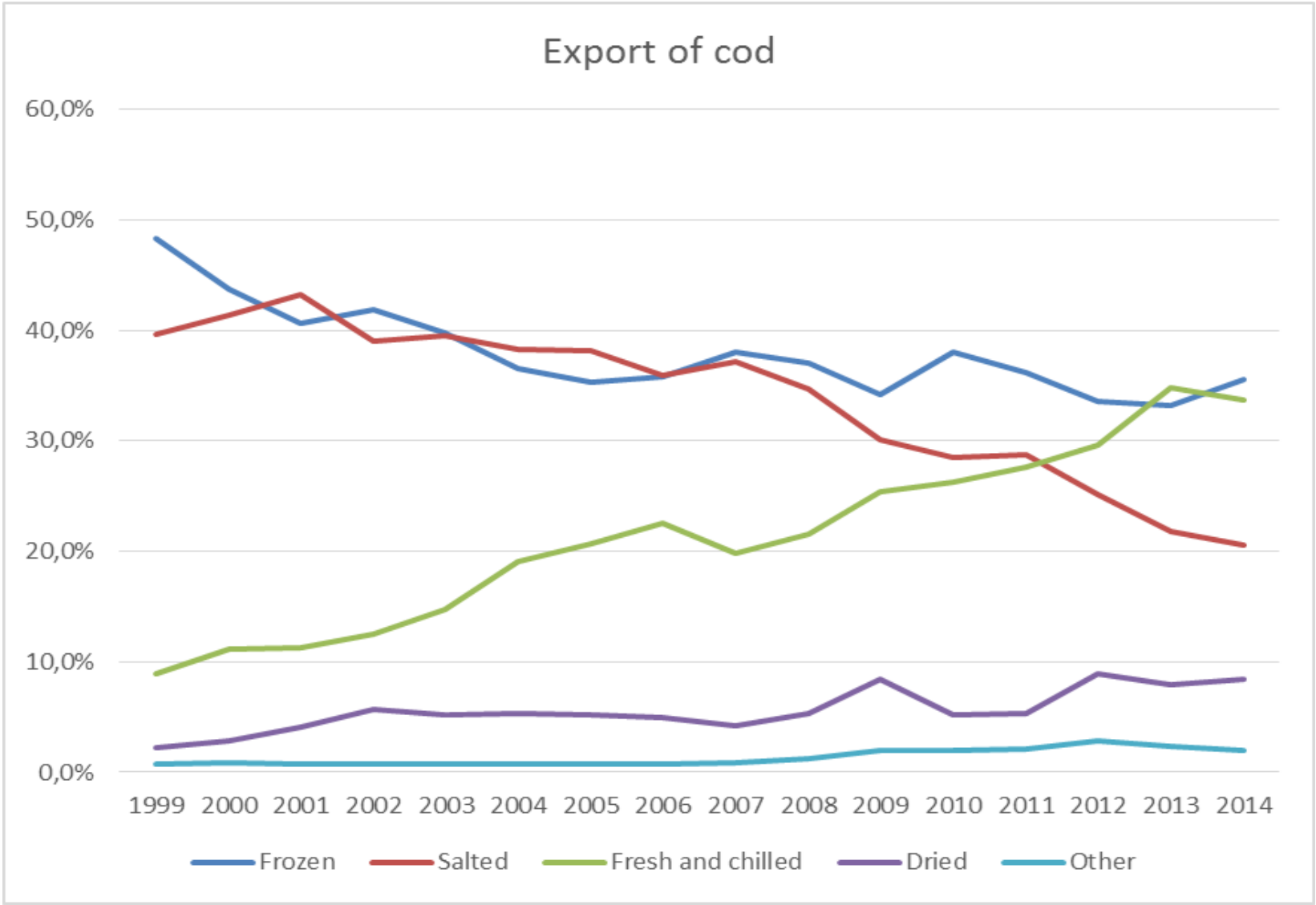


Huge increase in productivity

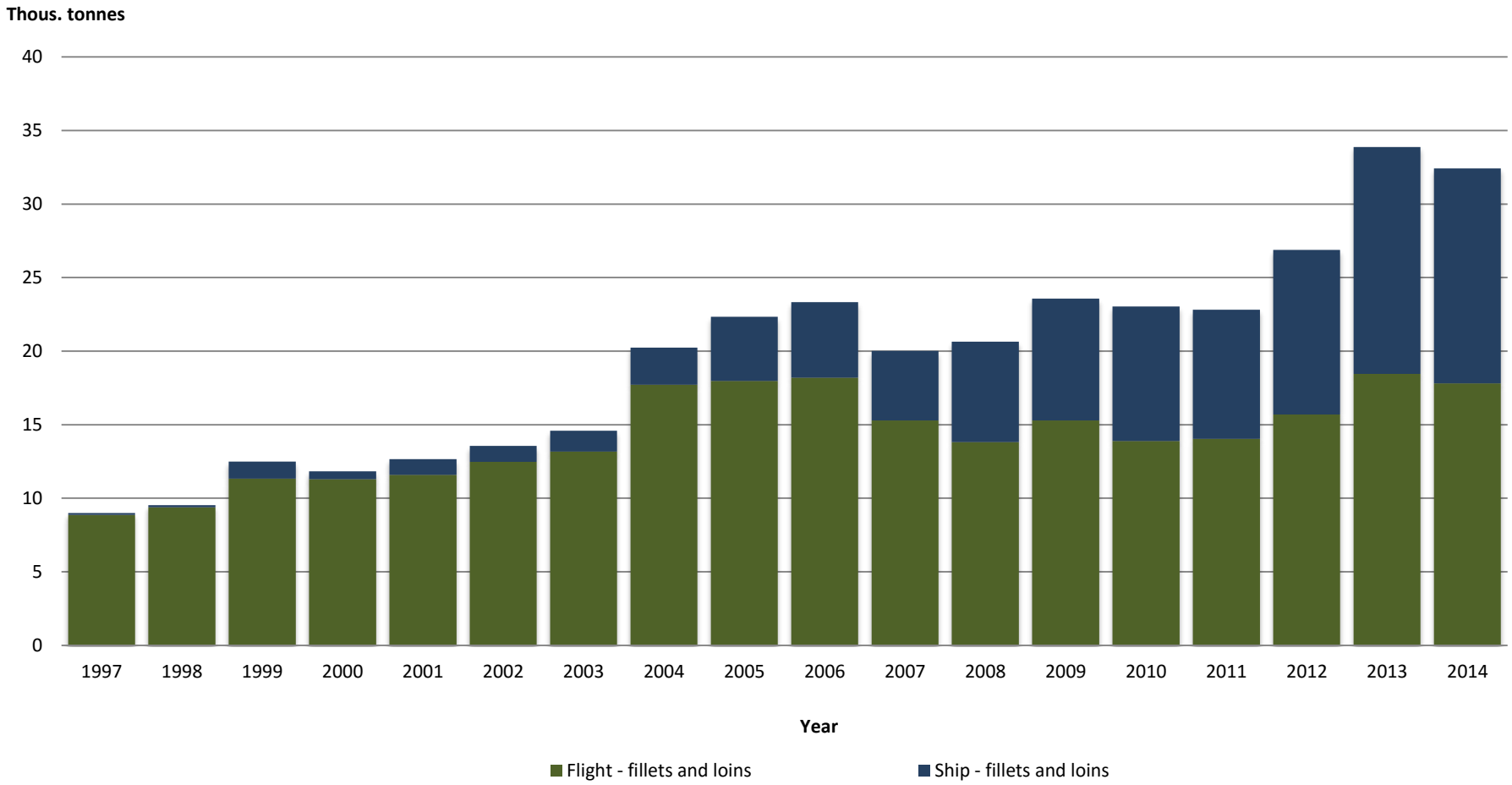


Export of Cod

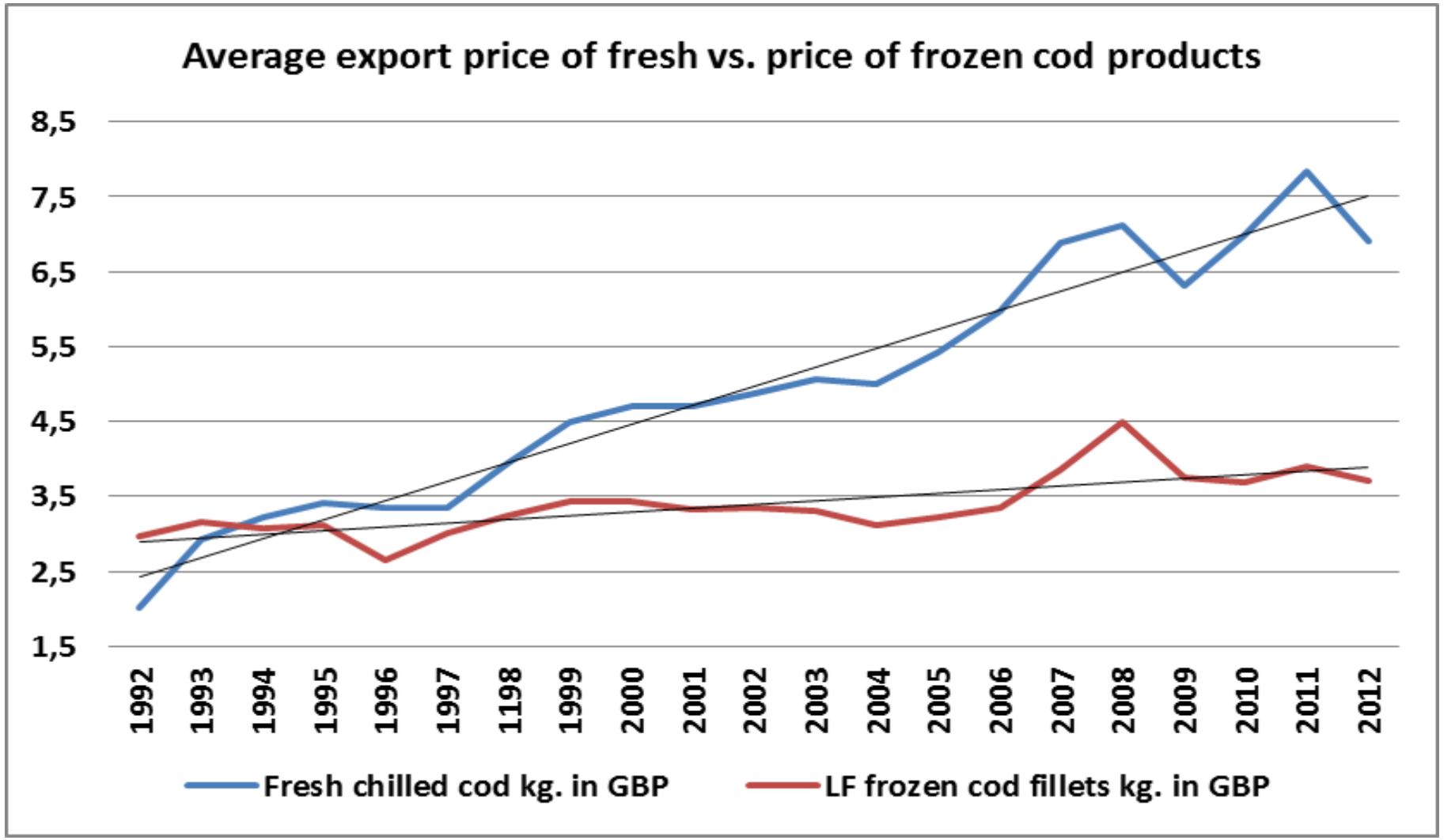
- The export of cod products has changed a lot since 1999 when frozen products accounted for 48.3% of the total value of cod products.
- In 2014 frozen products is down to 35.6%.
- In the same time fresh and chilled products has gone from 9% in 1999 to 33.6% in 2014.
- In 1999 the export was mainly whole fish while in 2014 it is more or less loin cuts and fillets.
- The share of salt fish export decreased from 39.7% in 2014 to 20.6% in 2014.



Fresh fillets and loins from Iceland 1997-2014



Prices of fresh vs. frozen cod



Value (fob price) added from wet fish price

Cod	**1992-99**	**2000-05**	**2006-10**
Fresh whole fish	67%	45%	34%
Fresh fillets	**64%**	**94%**	**107%**
Land frozen	43%	40%	26%
Frozen at sea	38%	47%	31%
Salted	97%	83%	80%

Value Creation

- Value creation is highest in direct marketing connections
- Specialisation has increased value creation
- Governance of the Value chain by use of marketing information

"Less is more"

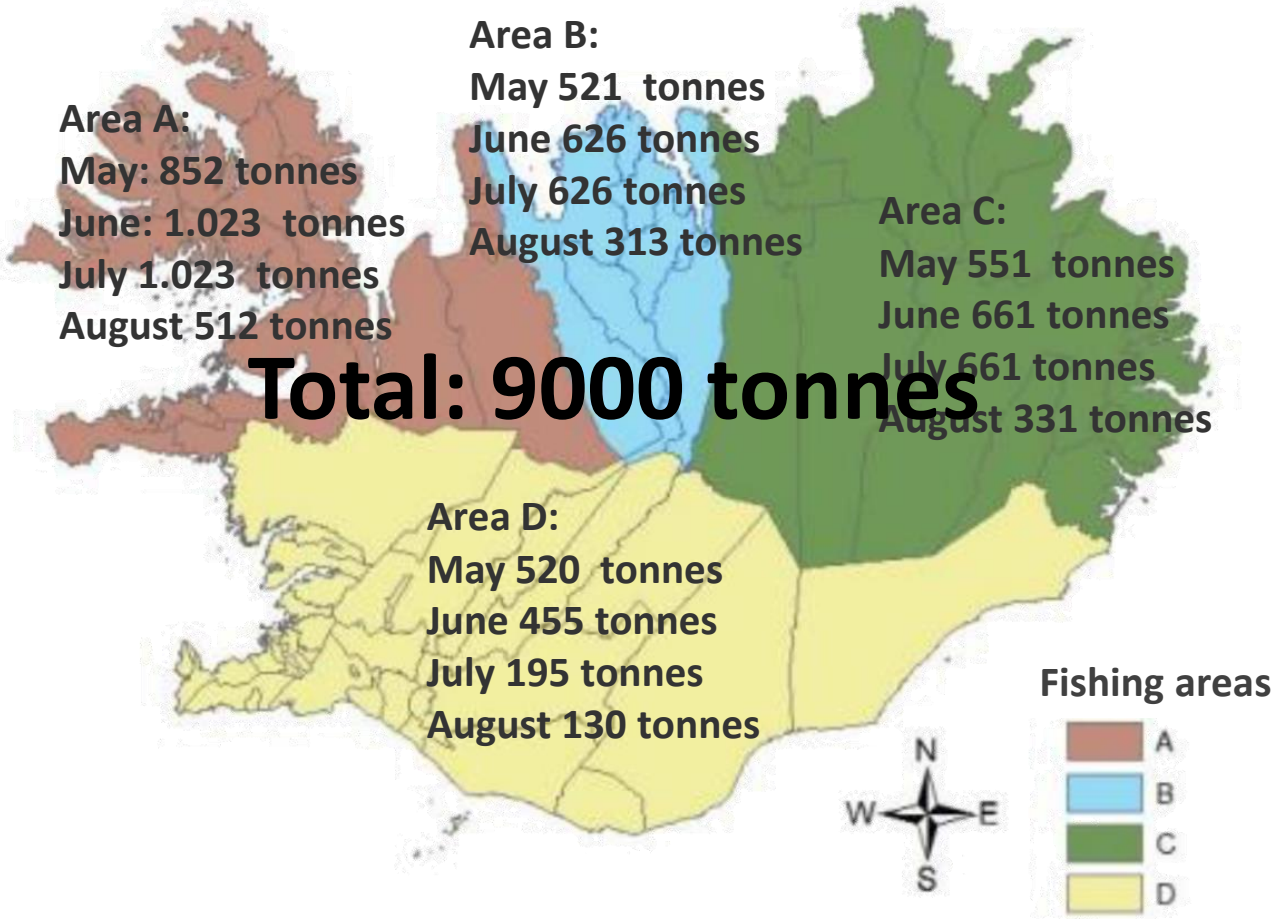
Small scale fleet

- Industrial fishery in Iceland quota regulated since mid 1980´s
- Small scale fishery (originally <10 gt, then <15 gt and <30 gt since 2013)
  - Regulated by effort restrictions from seventies
  - Quota regulated from 1990 for >6 gt and choice of system for <6 gt. Some additional changes in 1996
  - Quota regulated since 2000 (fully implemented 2004)
- Economic outcome of quota systems very positive but the system is highly controversial

An interesting experiment: the coastal fishery

- Introduced in 2009 and made permanent in 2010
- Goal:
  1. To facilitate recruitment
  2. To support rural development
- Limited to small vessels during summer months
- TAC split between 4 months in 4 areas
- Daily limit of 650 kg and 14 hours fishing per vessel
- Only hand line (no more then 4 per vessel)
- No fishing Friday to Sunday
- Only owner operated and locally registered

Fishing areas and monthly limits 2016

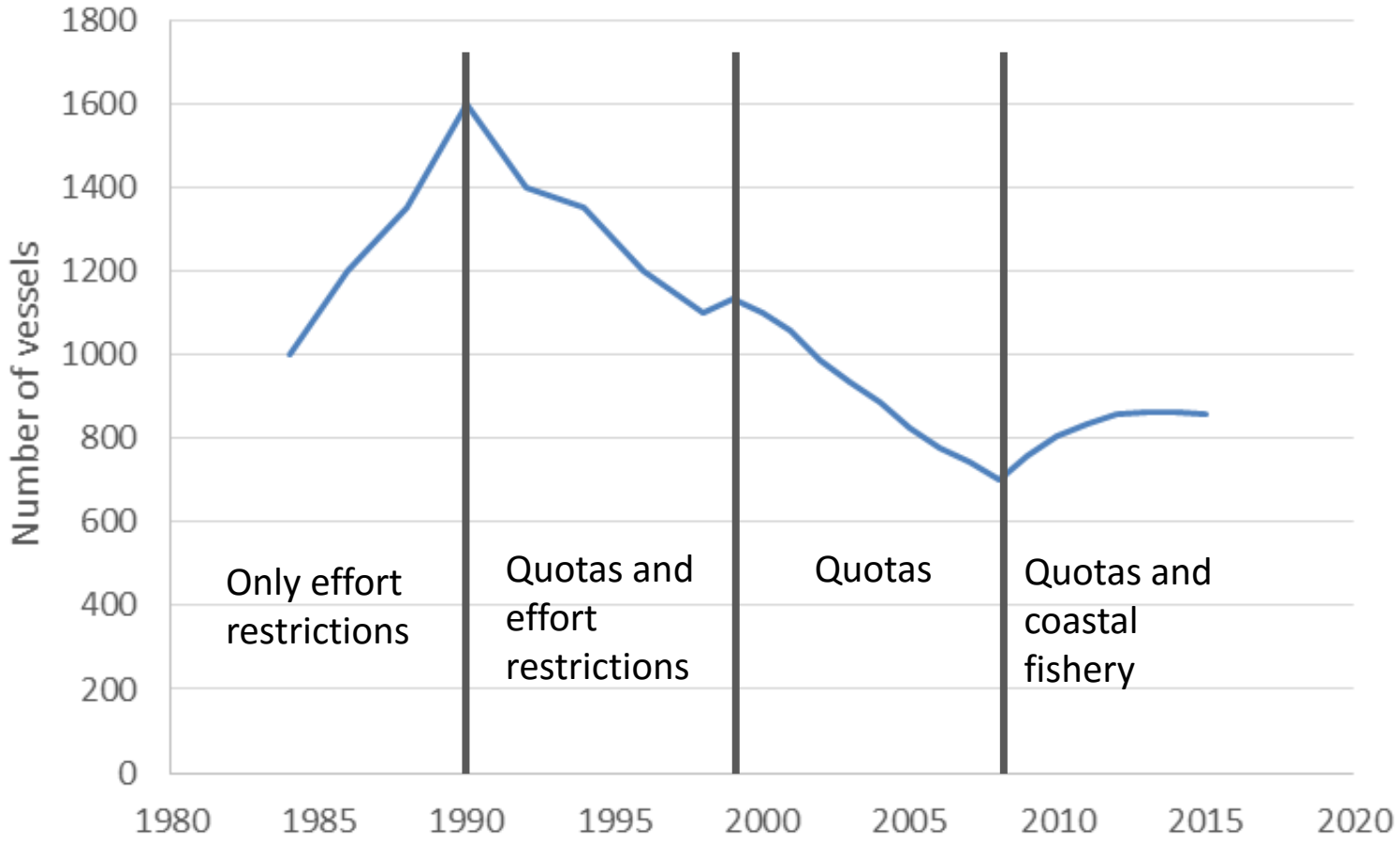


Source: Fisheries directorate of Iceland

Hypothesis
(from the pessimistic economics)

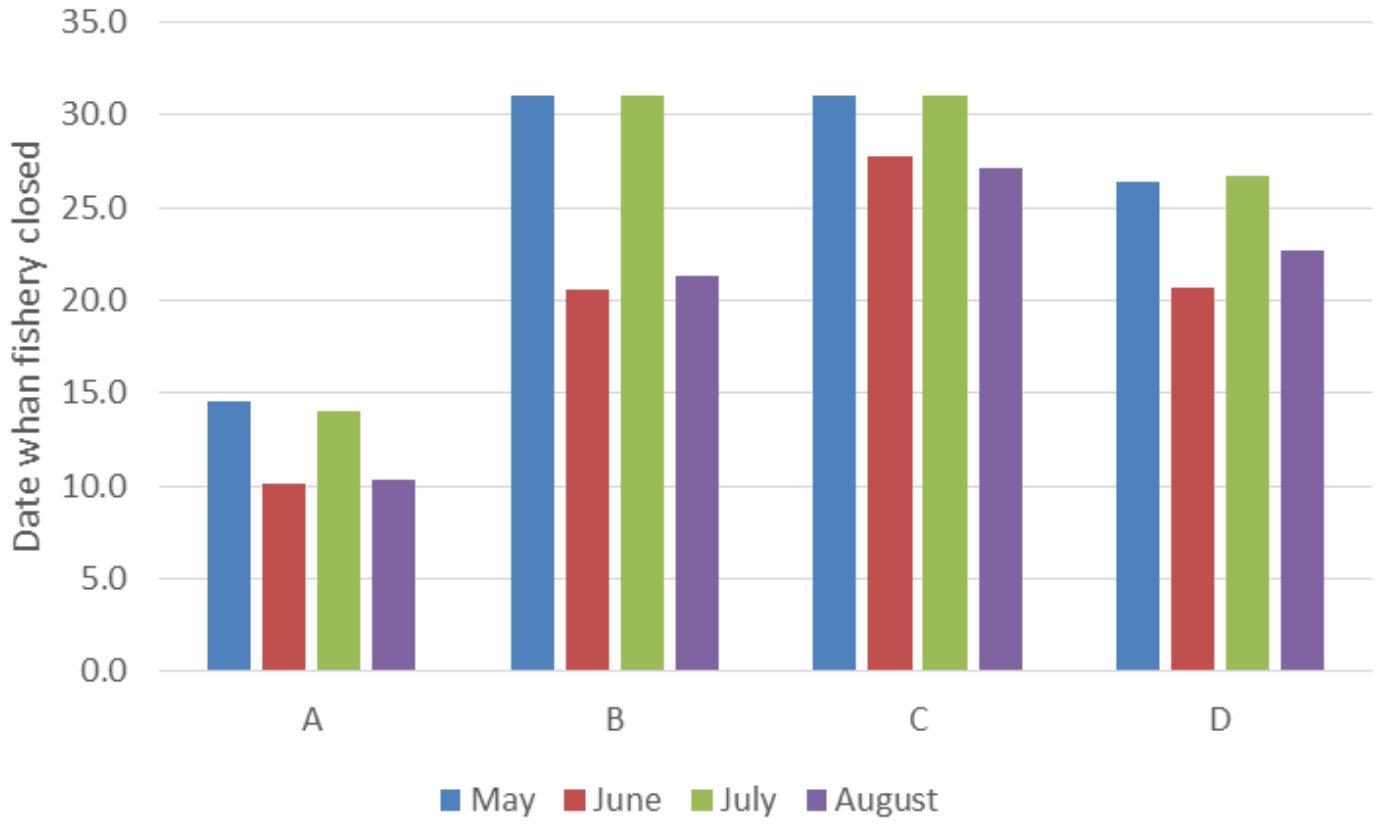
- Competition between fishermen leads overcapacity and higher cost
- Focus on quantity leads to poor quality and low prices
- **Overall poor profitability**
- Quantity restrictions per day may encourage discards
- ‘Gold rush’ mentality increases risk of injury

Small scale fleet size development



Source: Statistics Iceland, Þórðarson (2015)

Monthly season (average 2010-2015)



Source: Ministry of the interior

The fleet

VS

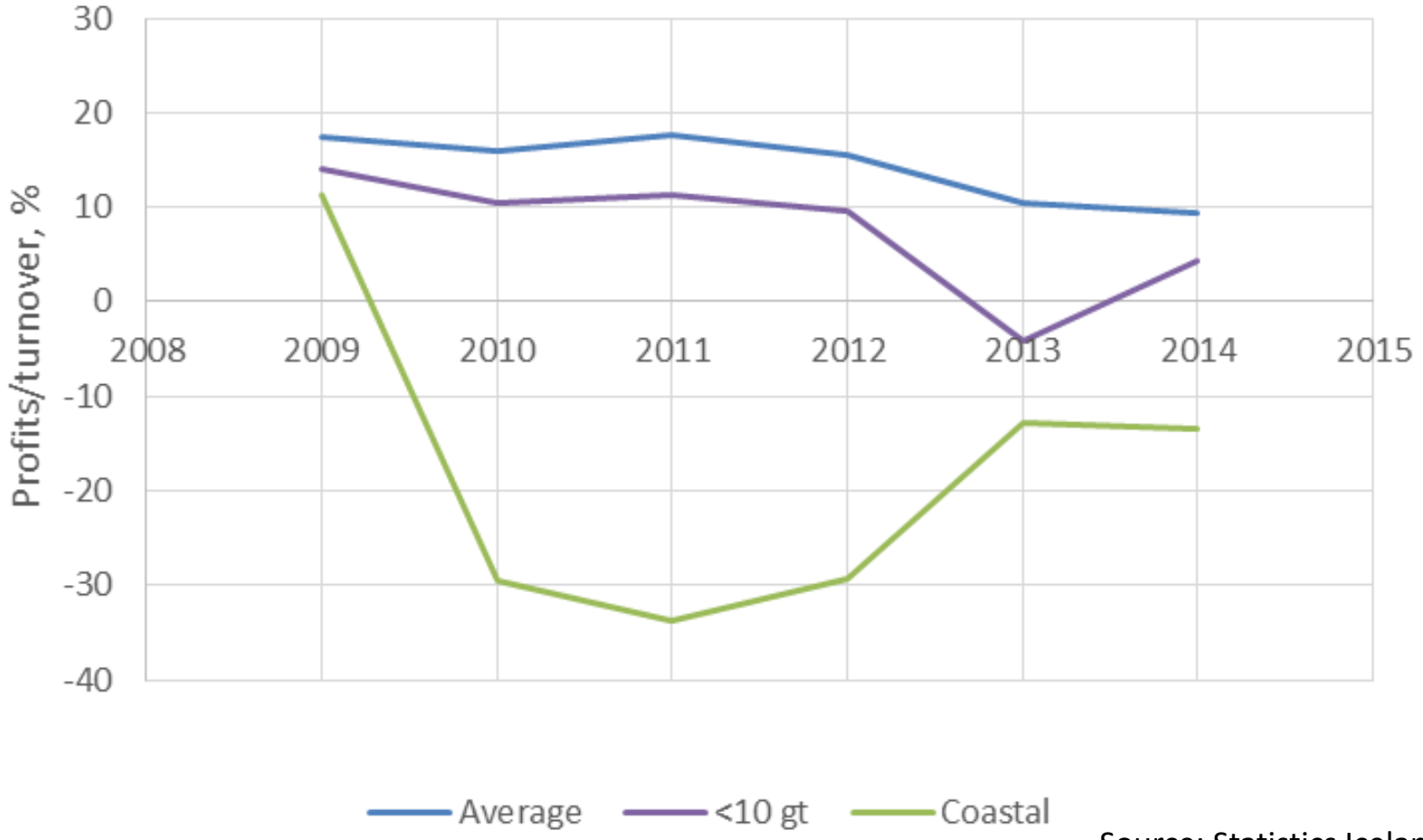
Quality issues

- Initial complaints (2009 to 2011)
  - 2010 survey by Matís ltd. - Icelandic Food and Biotech R&D showed varying quality and problems with cooling, ringworm, bruising and skin discoloring
  - 2011 survey of buyers confirmed varying quality
- Data on landing prices does not show a significantly lower price of coastal fish

EBITDA ratio

Source: Statistics Iceland

Profit ratio



Source: Statistics Iceland

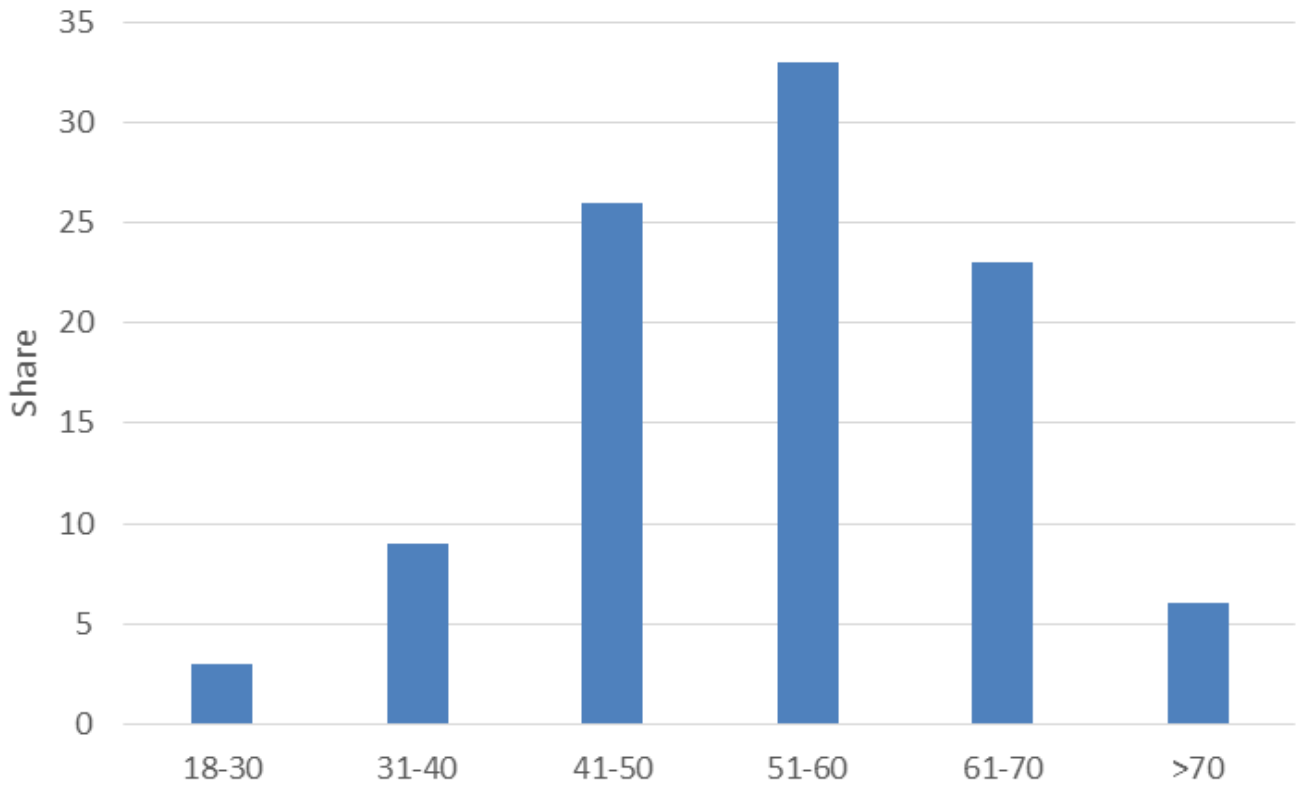
Fishermen safety

	Accidents			Catch*		
	Coastal fleet	**Total**	***Share***	**Coastal fleet**	**Total**	***Share***
2010	23	169	*13.6%*	6000	254.687	*2.4%*
2011	17	154	*11.0%*	8499	270.373	*3.1%*
2012	17	137	*12.4%*	8600	281.248	*3.1%*
2013	42	169	*24.9%*	8600	331.168	*2.6%*
2014	10	98	*10.2%*	8600	381.431	*2.3%*

* Cod equvalents

Source: Sæmundsson (2015)

Recruitment 2009



Source: Vestfjord University Center (2010)

Conclusion

- Icelandic politicians have managed to verify everything economists think is wrong with Olympic fishing (thank you for that!)
- The losses are in the range of 10 to 40% of catch value
- The social benefits must be very large to justify this as a management policy

INFLUENCING FACTORS ON THE DEVELOPMENT OF THE VALUE CHAIN

MAIN INFLUENCING FACTORS

- Structure of the value chain/
  - Direct marketing connections
  - Governance of the value chain
- Fisheries managements system
- Fish Auction markets
- Specialisation
- Innovation
  - creating value from by-products
  - cooling, flow lines, cutting machine, grating etc..

Main changes in the Structure

- Consolidation in quota holdings and in processing
- Better handling and grading of wet fish in harvesting
  - Shorter fishing trips
- Improvements in logistics and transport technology
- Increased emphasis on high-tech production
  - Increased productivity
  - Higher efficiency in the industry especially in land processing
  - Higher yield pr. volume of wet-fish
- Vertically integrated companies have moved into marketing with their own marketing divisions
- More direct marketing connections/cooperation

Structure of the industry

- The sectors' development has taken two main paths
  1. Relatively large vertical intergraded firms covering harvesting - (high tech) processing - marketing
  2. Small independent firms covering just one link in the VC of harvesting, (low tech) processing or marketing
- Companies have freedom to position themselves in different strategic positions in the value chain
- No one standard position is found to be correct - it gives the company freedom to select its position and strategy

The Impact of the quota system on profitability

- The quota system improves the control of individual companies over their production systems
- Creates opportunities for serving the markets in a better way
  - Lowers the cost of fishing
  - Increases the value of the catch
  - The attribute of the fish decides its value
- A requirement is that the fishing companies can respond to relevant marketing information

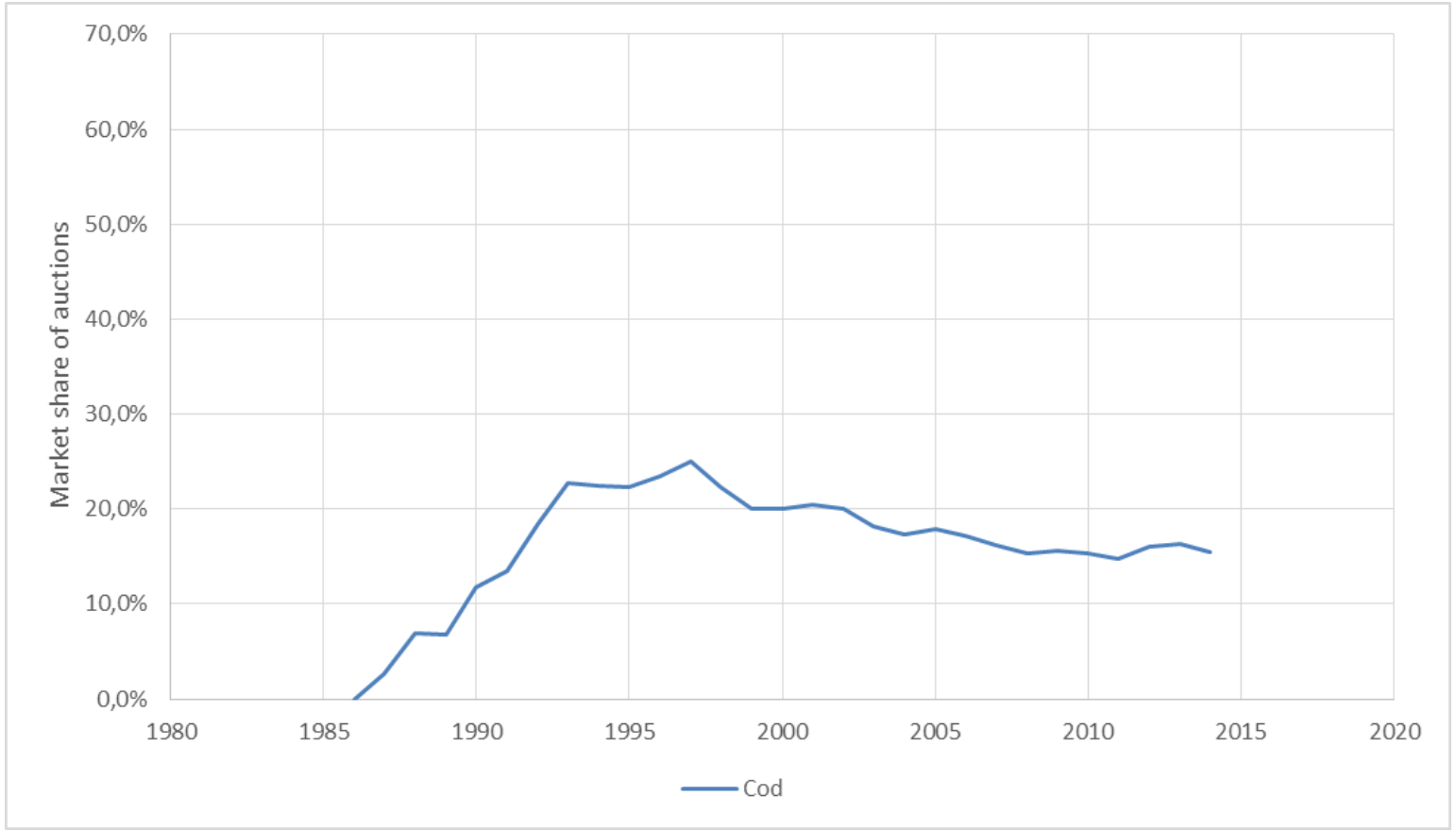
A. System that allows the companies to control their production

B. The value system that communicates information about the wishes of the consumer

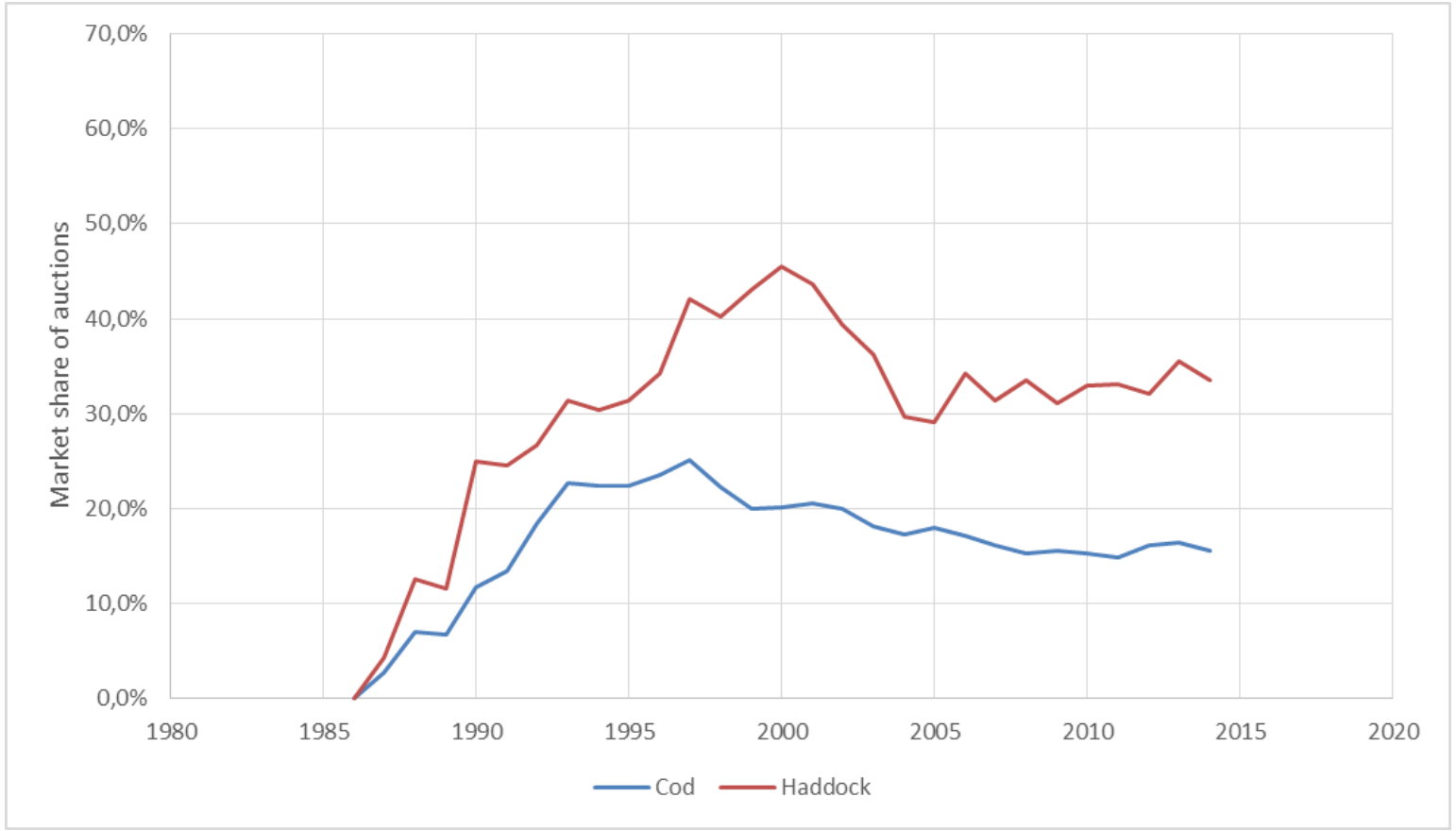
Fish Auction markets

- Relative low quantity of fish on the markets and high price has put a pressure on further value-creation/innovation
  - New small companies have entered the industry in processing of both by-catch and by-products
- Feeds market information and market signals to the fishermen
- Transparency in price formation
- Stability for producers to offer products to the markets
- Supports that the industry is flexible to adapt to different business models and situations

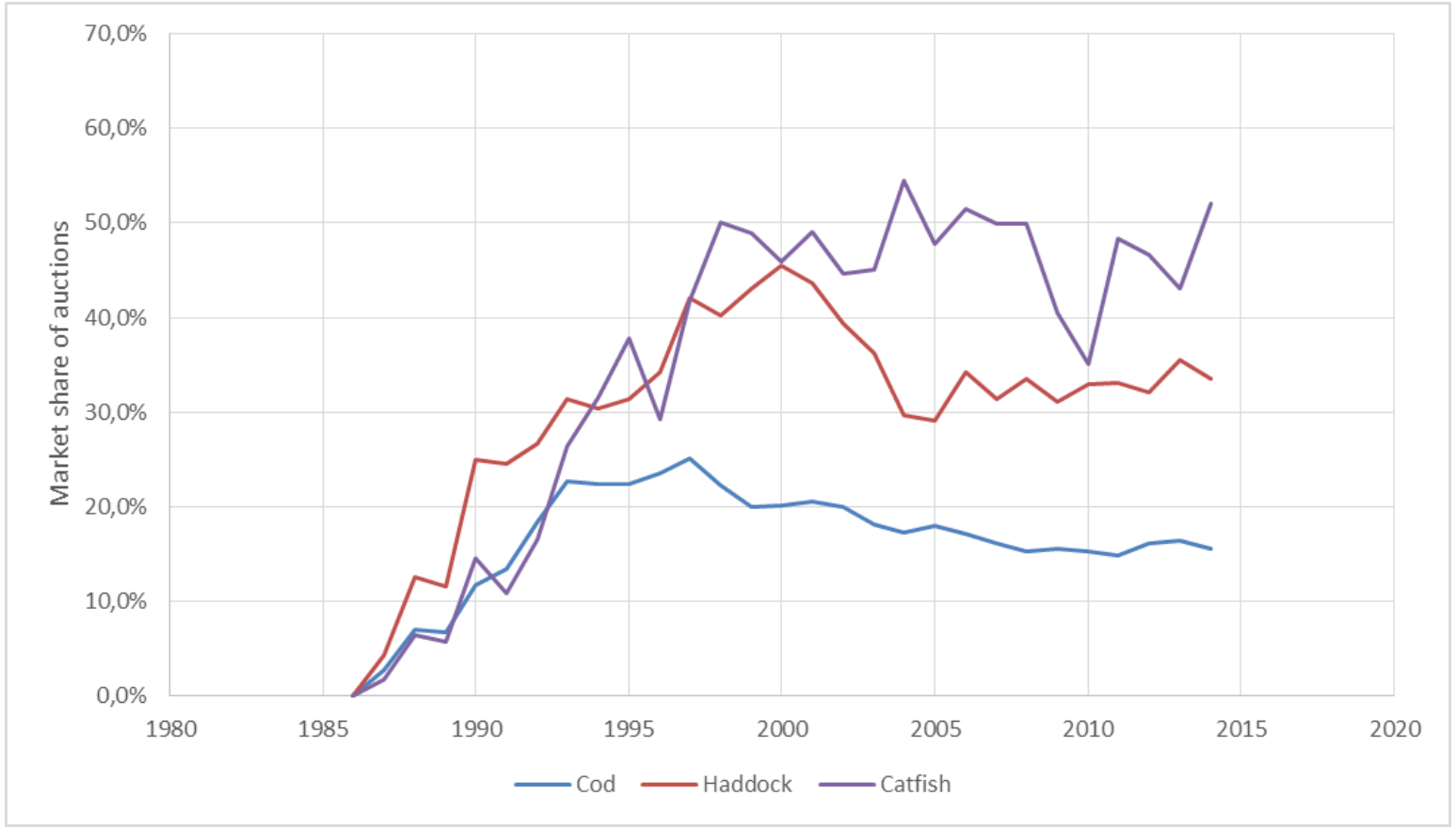
Market share of auction



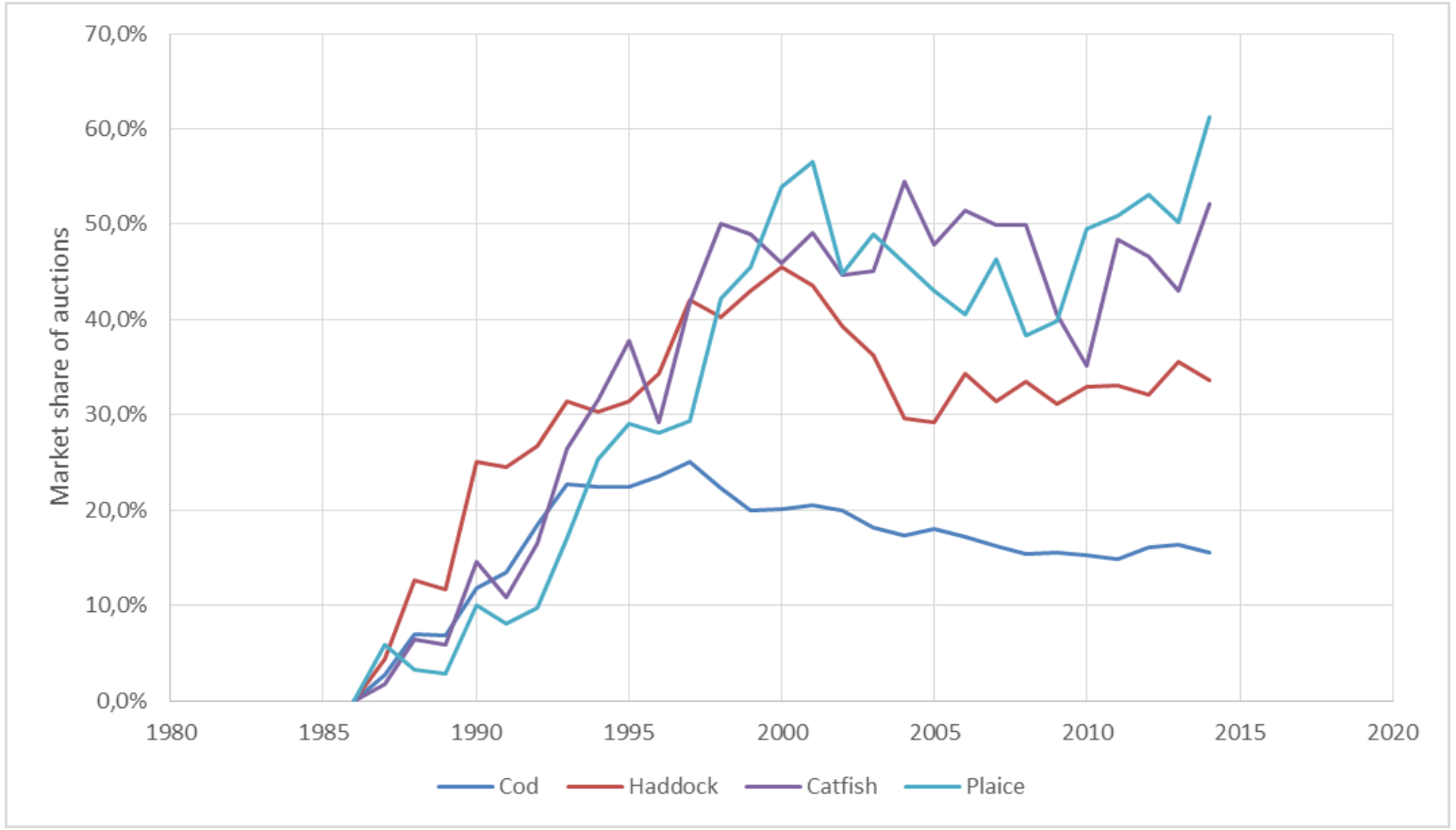
MARKET SHARE OF AUCTION

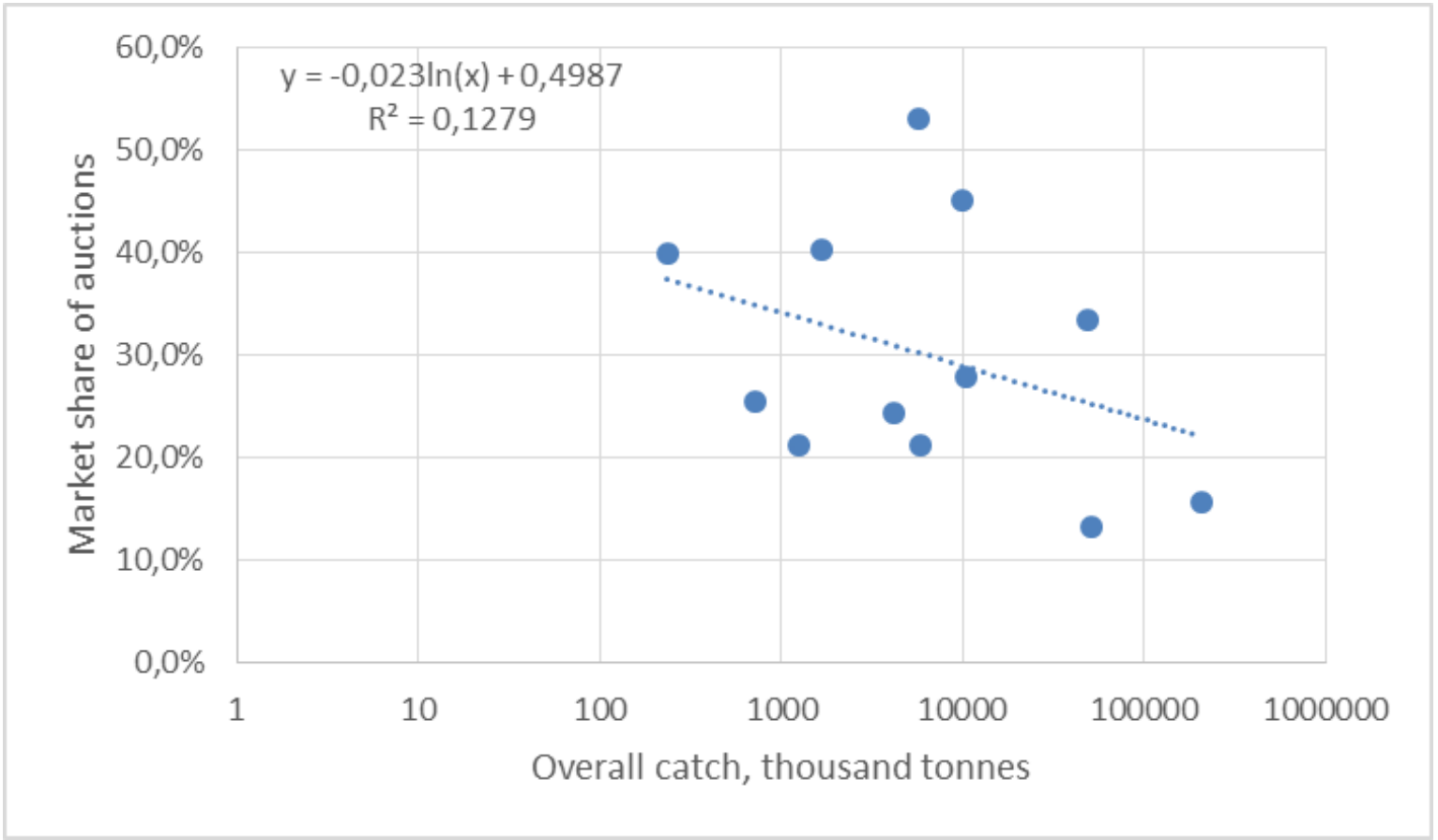


Market share of auction



Market share of auction




y = -0,023ln(x) + 0,4987
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40,0%
30,0%
20,0%
10,0%
0,0%
Market share of auctions
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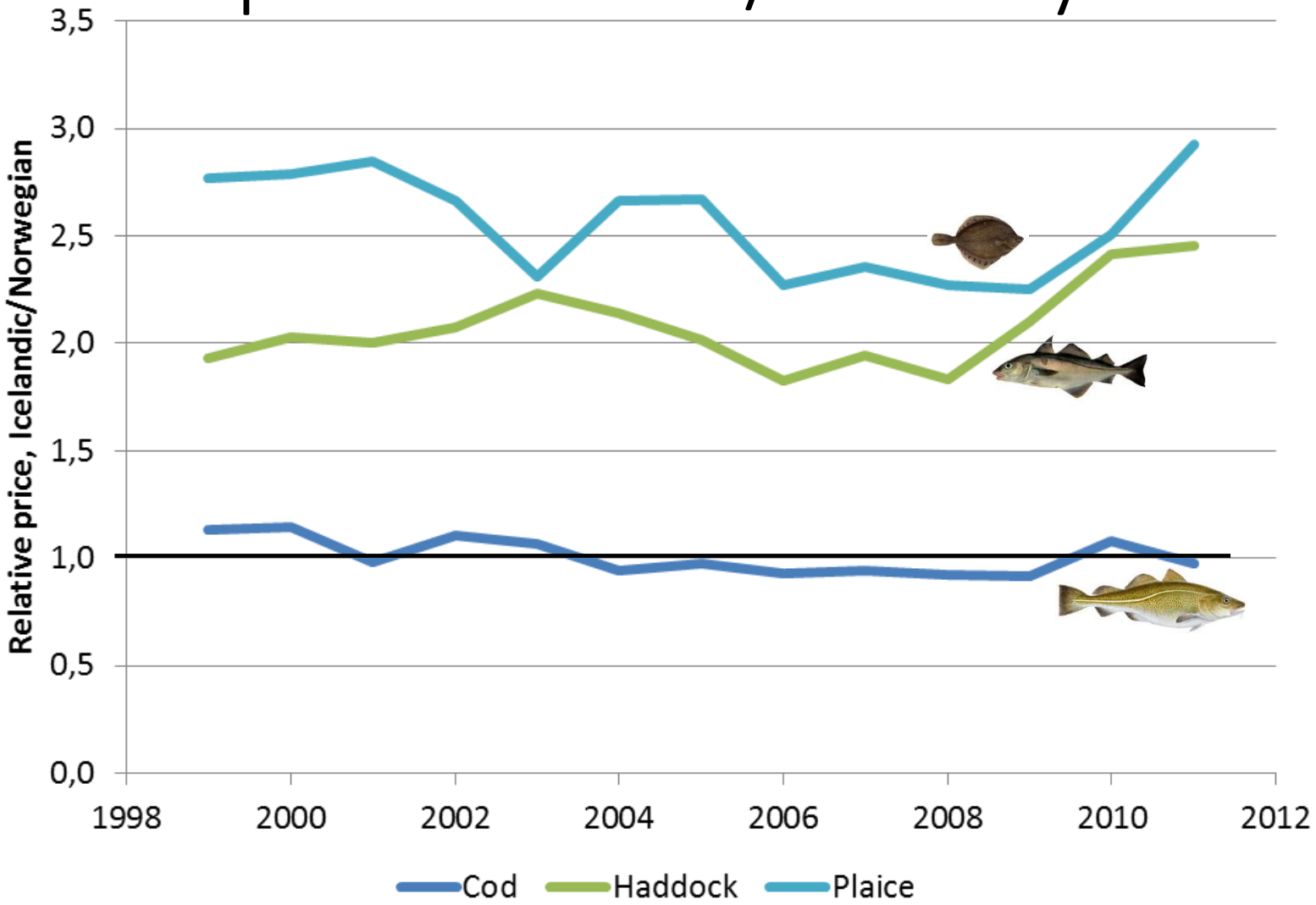
100
1000
10000
100000
1000000
Overall catch, thousand tonnes

Relative price Iceland/Norway



(Heimild: Hagstofa Íslands, SSB)

Specialisation

- The specialisation has fostered increased value creation and opened up new marketing opportunities
- Fish auction markets have supported the increased specialisation in production
- The ITQ system has also supported specialisation in the fishing sector
  - Fishing companies have specialised in species by selling and buying permanent quotas in order to better fit their business model
  - Adjustments within each fishing year
- It is apparent from the interviews with the interlocutors from the Icelandic fishing industry that they consider the ITQ system to be the key to increasing both the specialisation and efficiency of the industry
- The phrase “being in everything” is a past tense and specialisation has provided a much greater value creation through the emphasis of maximising the value creation from each kg wet fish

Innovation

- Demanding domestic industry
  - TAC went down
  - Need to increase value creation
- Land processing was loosing its competitive status to sea production – low value products
- Education of managers and specialist in the fish industry is getting more advanced
- No “waste” strategy

- The demersal industry in Iceland is aiming to create more value from “by-products” than the fillets
  - In 5 years time?
- Cooperation with companies in the fishing industry, equipment industry and research institution
  - Cluster cooperation
- Thinking out of the box, nothing is impossible, attitude

Collaboration is the key to success

Technical innovation and improvements

On board of fishing vessels, in processing and in transport

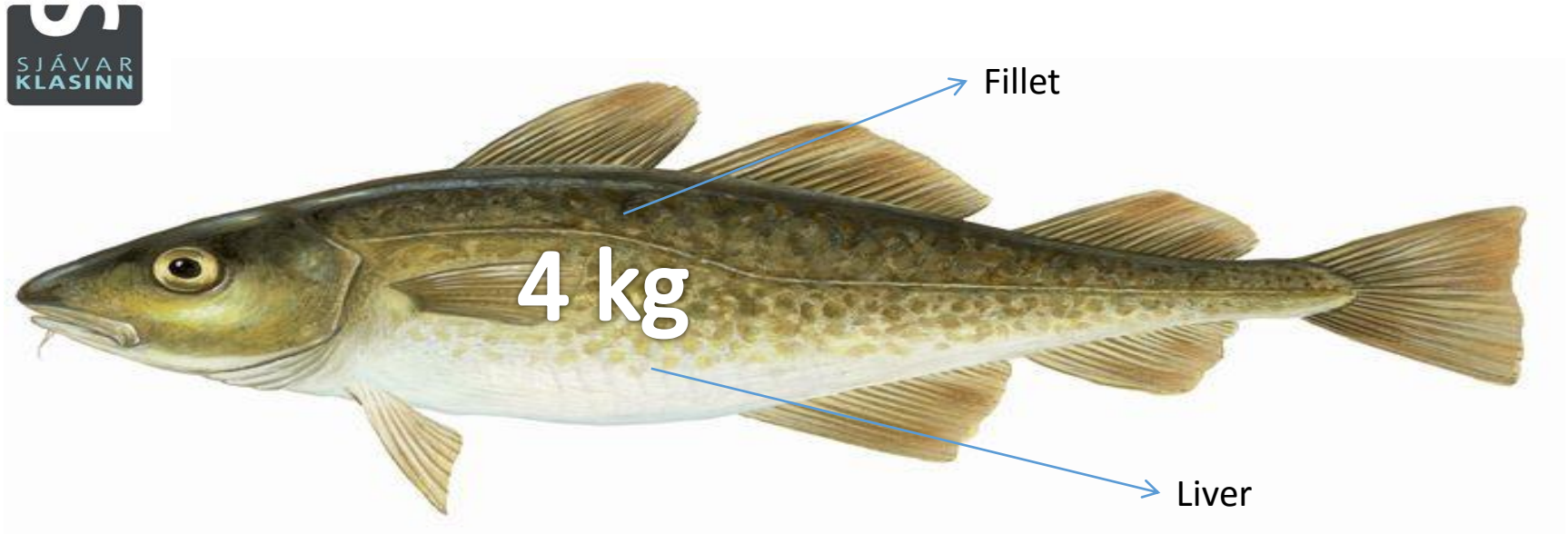
- On-board:
  - Post-harvest cooling technique
  - Speedier cooling, better bleeding and washing equipment
  - Improvements and new technique in icing in boxes
  - Shorter fishing trips
  - Maximum haul time
  - Fishing trips decided from marketing information
- In transport:
  - Improved temperature control
  - More frequent shipping both on sea and in air
  - Less capacity bottlenecks
  - Shorter time between processing and delivery

Technical innovation and improvements

In processing

- Higher yield
- More and speedier throughput
- Higher manpower productivity
- Higher degree (ratio) of primary products
- Better quality, accurate scaling/weighting
- Less time in the processing process, temperature control
- Yield (fillets from whole h/g) up from 45% to 52% in fresh/frozen
- In salted fillets up from 50% to 60%
- Heads (cod) from 32% to 27%
- Improved cooling in fresh fish-shelf time up from 6 days to 16 days
- Less waste, much higher degree of utilisation of by-products, cuts and off-falls, 97% of the cod used (optimal)

Example – cod in Iceland



Quality a key issue

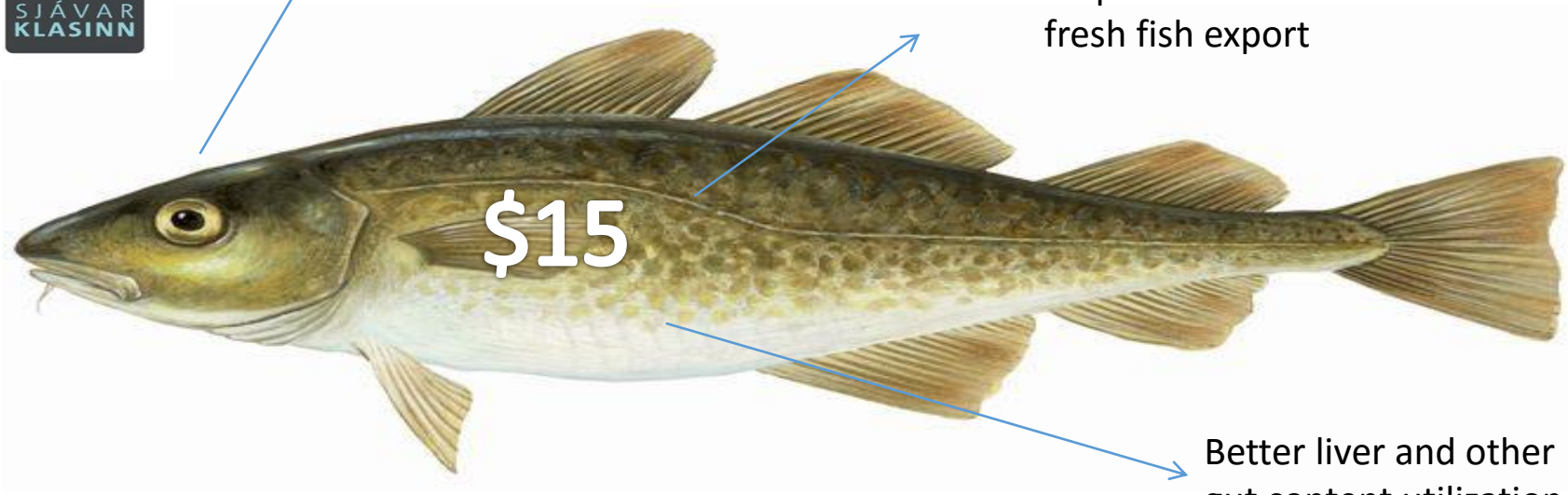
The value of a 4 kg cod

SJÁVAR KLASINN

Dried heads

SJÁVAR KLASINN

Fillet – imporved utilization and fresh fish export



Better liver and other gut content utilization


Canned fish liver products

Fish liver oil

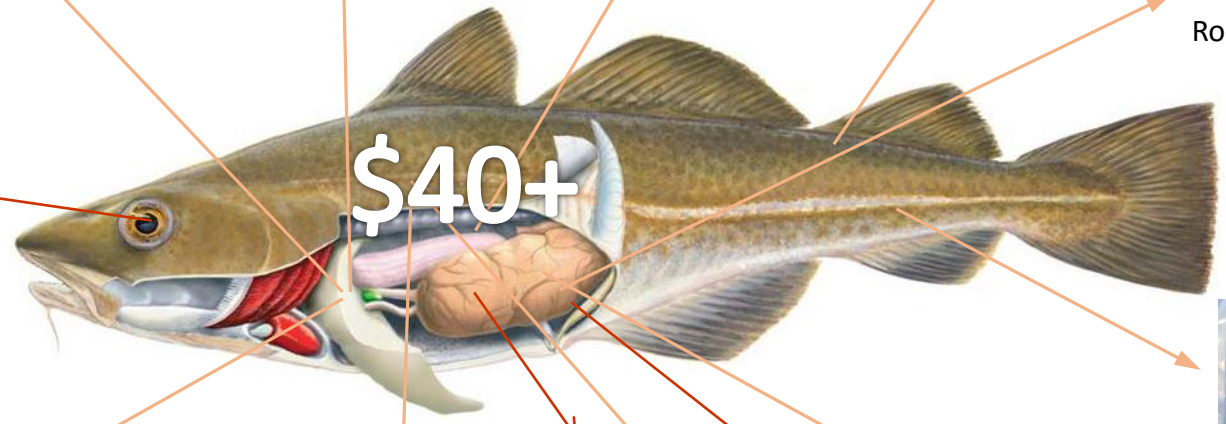
Enzymes used for natural fish flavourings

NIKE Dior

Fish leather used by shoe & fashion industry

Roe, caviar and spreads

Dried heads



Pharmaceutical tissue and nerve-regeneration products

Enzymes from the gut used for cosmetics, hygiene & pharmaceutical products

Beauty collagens (anti-aging products)

Gelatin pharmaceutical capsules

Hand & foot creams for preventing and treating diabetic ulchers


NIKE


NIKE
ALEXANDER WANG
BROWN SHOE
CHANEL
Salvatore Ferragamo
ESCADA
Dior
GUCCI
KENZO
GIVENCHY


74000
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24/05/2012

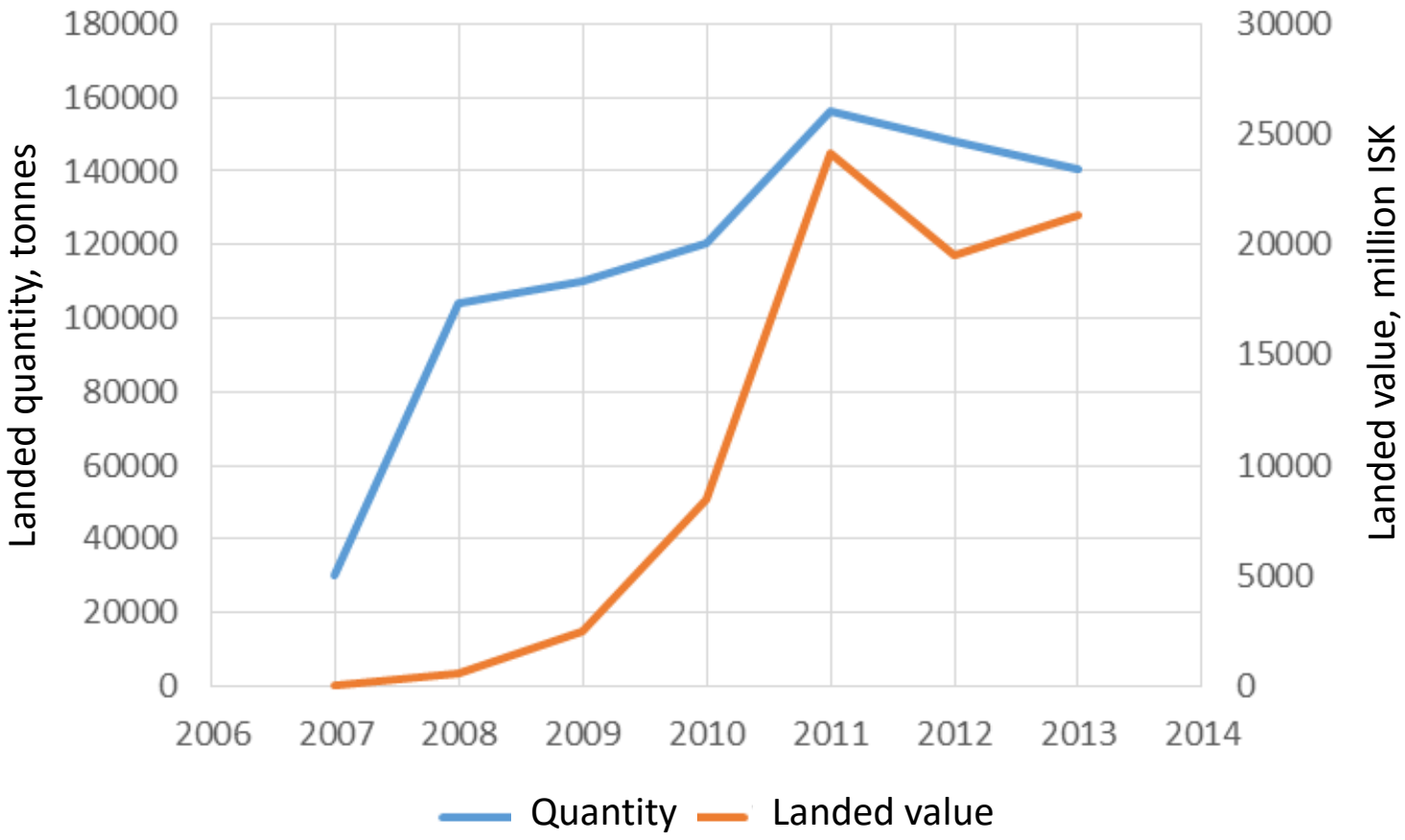

Baby K

Importance of research

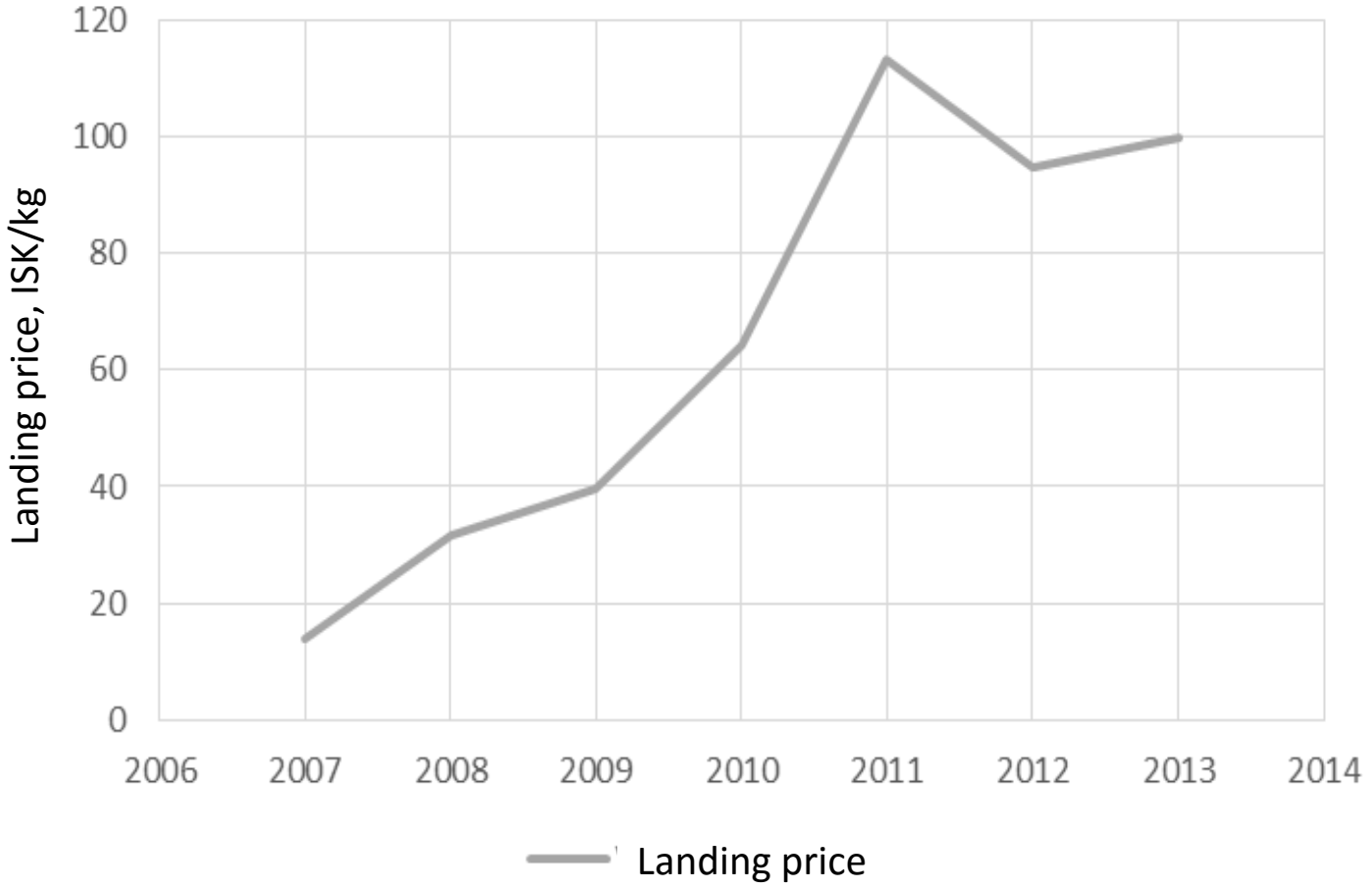
Universities and institutions

Industry

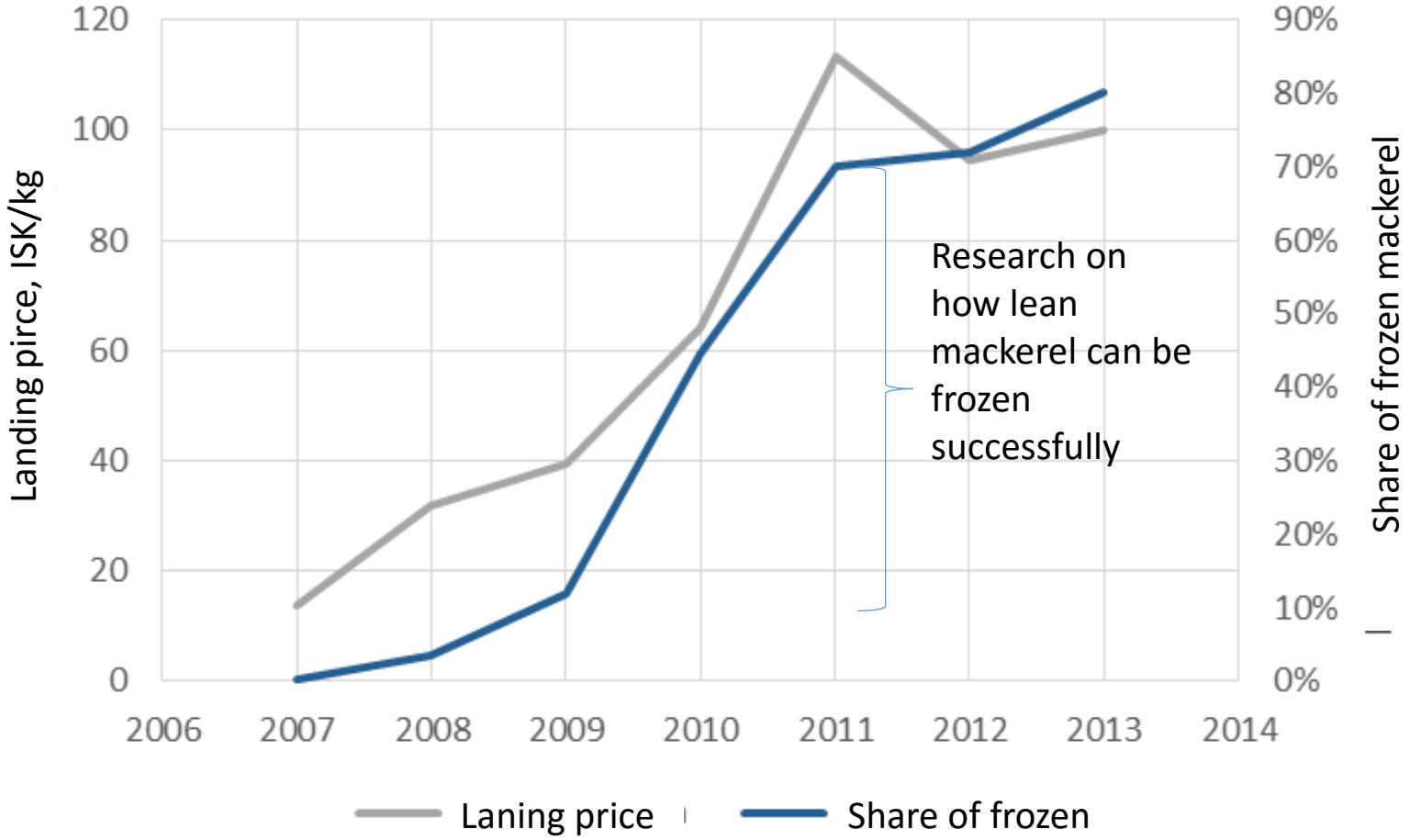
Example - mackerel

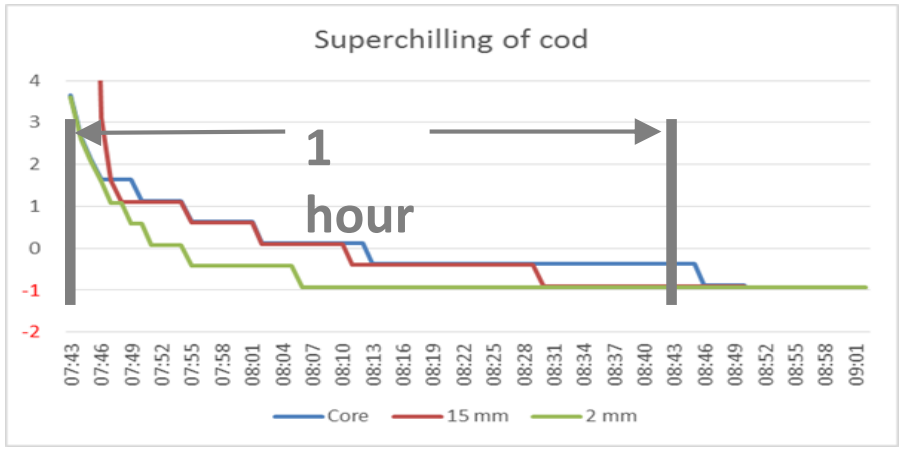


Example - mackerel



Example - mackerel




Superchilling of cod
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Summary

BUSINESS MODELS IN THE FISH INDUSTRY

- Two different approaches:
  - Harvesting/Production-Driven – Harvesting/production-led cost-driven business model (marine-based), producing bulk standardised commodity products
  - Market-Driven - Market-responsive business model (land-based), driven by market signals and consumer wants to produce high-value (branded) products

- Is the third approach emerging?
  - Research and value–driven – Focus on value creation using research and innovation to create higher quality according to market attributes and generate
  - Using hich-tec methods in handling, processing and in logistics
  - added value out of “by-products”,

Competitive value chain

- Very large benefits from well functioning value chains
  - Coordination of consumer demand and fishing activity generates more valuable products
  - Even flow of high quality raw material creates potential for full utilization of raw material
  - Large increase in value added
- Role of governments
  - Important that the industry have the flexibility to adopt to the business environment with their own strategy and strategy position
  - Restriction can be very harmful for the industry, it must be able to maximise its operations in different ways
    - Not without limits
  - There is no right way or strategy some companies are independent other vertical integrated in cooperation or go it alone strategy

Born to be wild?

- Market orientation is crucial in value creation in fisheries
  - Requires a quota system, liberalized fish markets and good market access
  - Effect evident when compared to Norway
- Not without cost
  - ITQ's and liberalized fish markets improve profitability but at a cost
  - Rural development
    - Uncertainty in rural primary industries affects secondary industries
  - Instant millionaires created by quota trade

To be competitive the fish industry need to be tamed

Thank You!

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