Access to Seafood in the U.S. Insights from the Economics of Aquatic Foods

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Presentation to NASEM Study Committee
The Role of Seafood Consumption in Child Growth and Development
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Thanks to many collaborators on individual pieces of this talk, especially Frank Asche, Julia Bronnmann, Andreea Cojocaru, Håkan Eggert, Atle Oglend, Tess Petesch, and Cathy Roheim

1. Prices are extremely important

People consume more seafood when:

- **seafood prices are low**
- **prices of substitutes (e.g. other animal proteins, vegetable-based proteins, or other seafood products) are high**
- **income is high**

Recent Studies of U.S. Consumer Demand Using Scanner Data

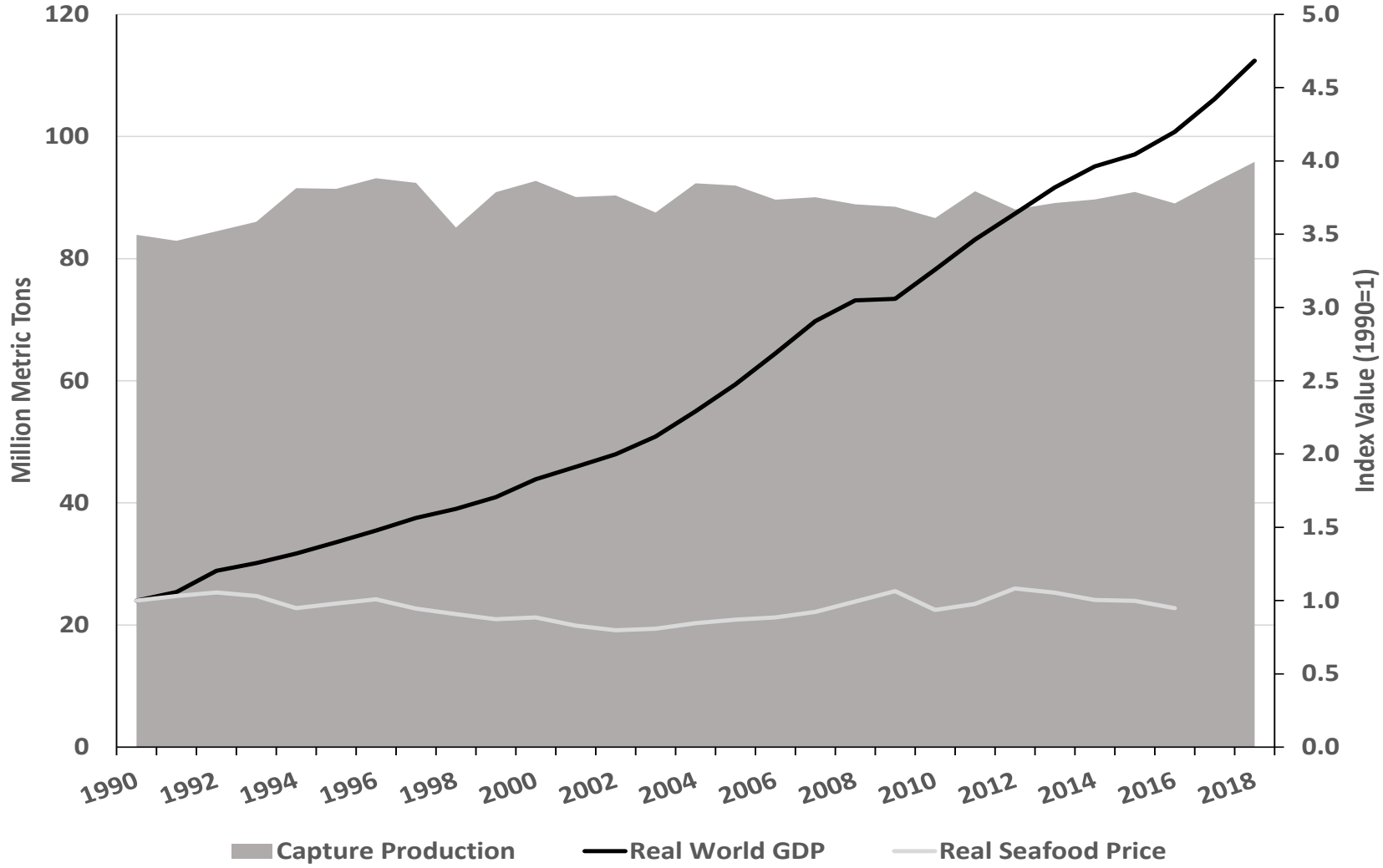
- Price and income elasticities of demand for seafood are heterogeneous across commodities
- Seafood consumption is geographically heterogeneous
- Demand for most seafood products is own-price elastic or near unit-elastic (1% price increase leads to >= 1% consumption decrease)
  - Consumption quite responsive to price
- Demand for seafood is typically income inelastic (a necessity)
  - Expenditures on seafood go up as people get wealthier, but share of seafood in the budget shrinks

Dey, M.M., Surathkal, P., Chen, O.L. and **Engle, C.R.**, 2017. Market trends for seafood products in the USA: Implication for Southern aquaculture products. *Aquaculture Economics & Management*, *21*(1), pp.25-43.

2. Real seafood prices have remained low despite massive growth in demand

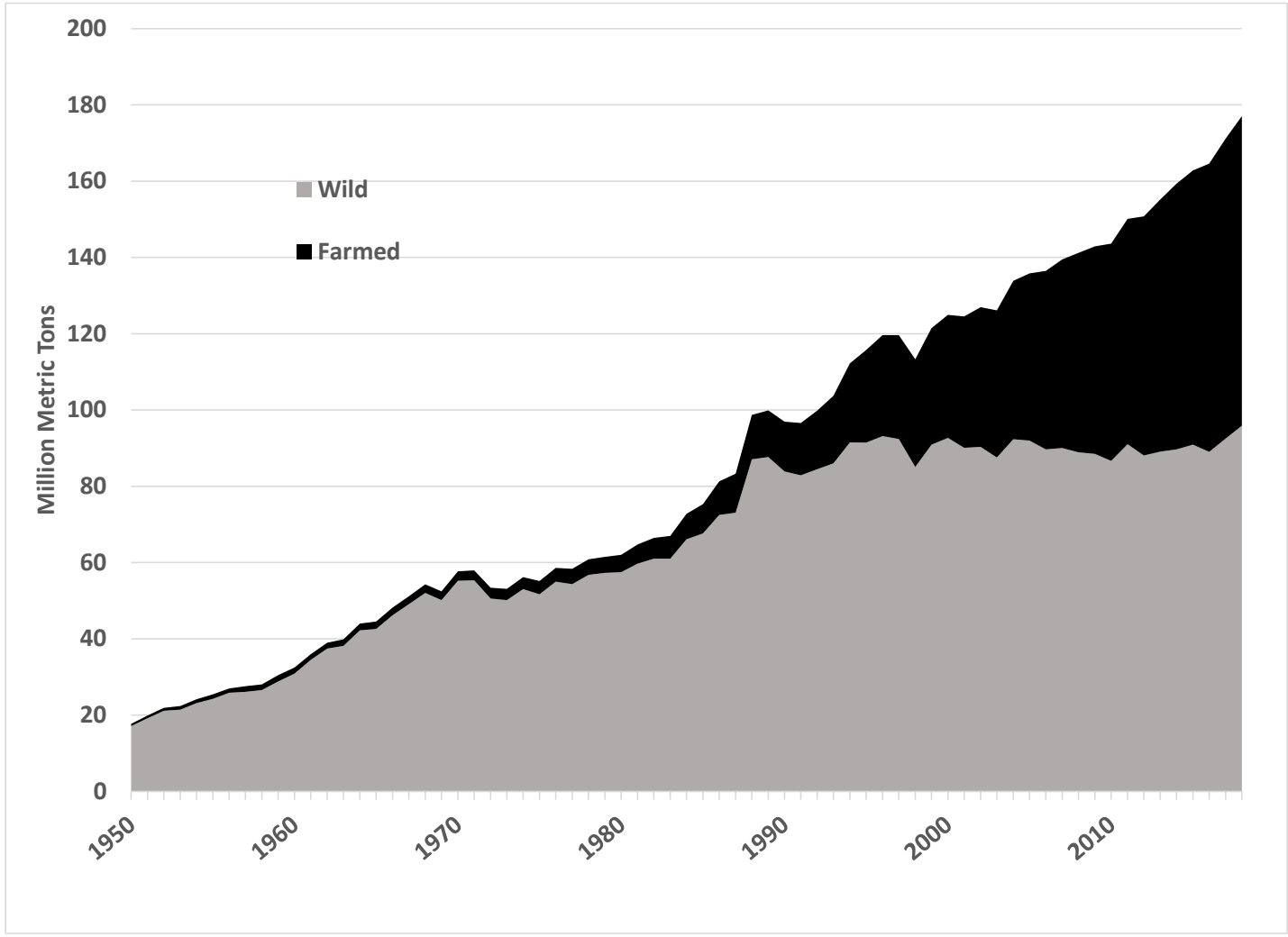
Access to affordable seafood has increased!

Why have global seafood prices remained stable despite rising demand and flat capture fishery landings?



Asche, Eggert, Oglend, Roheim, and Smith *REEP* 2022

Aquaculture



Fishmeal and Fish Oil Production Has Not Limited Aquaculture Growth

From Asche et al. REEP 2022

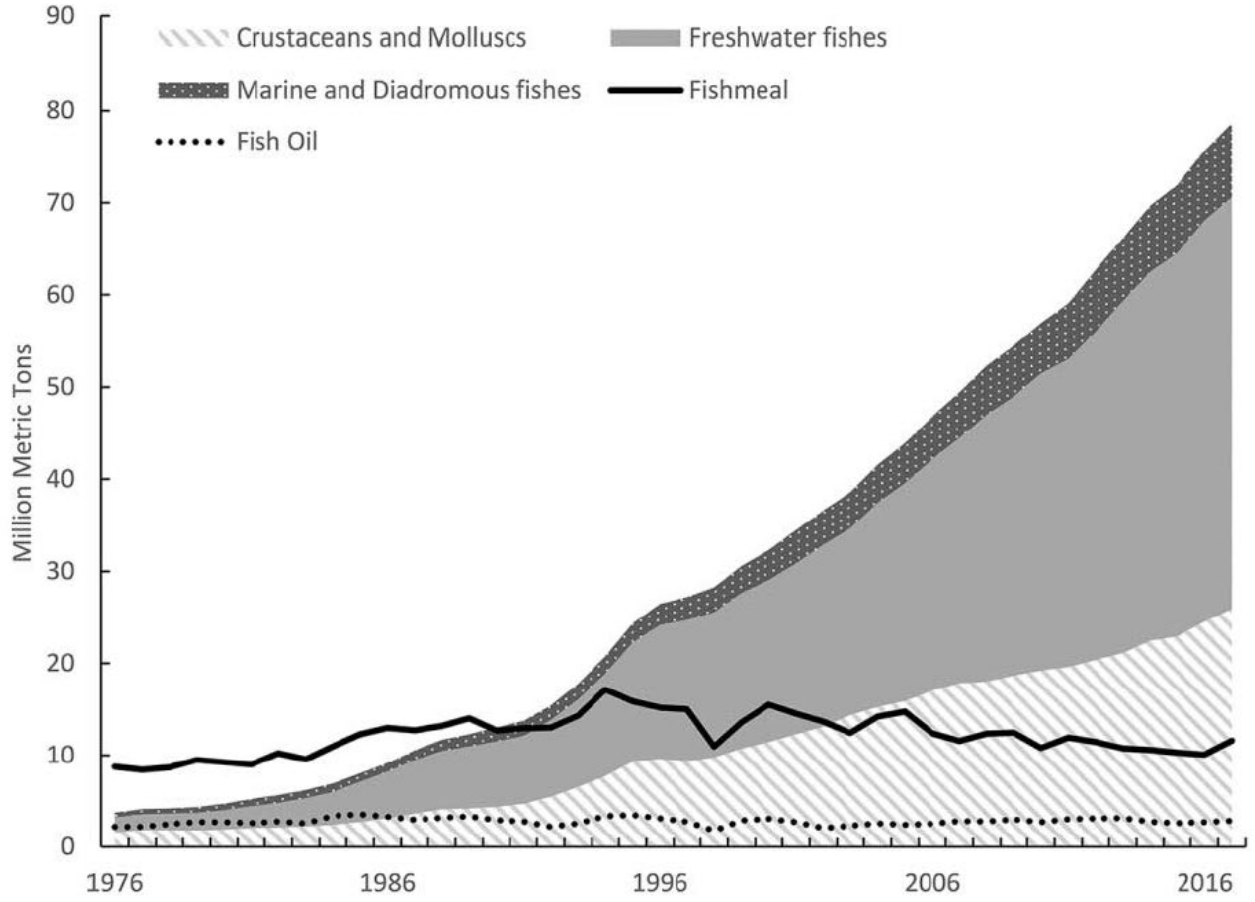
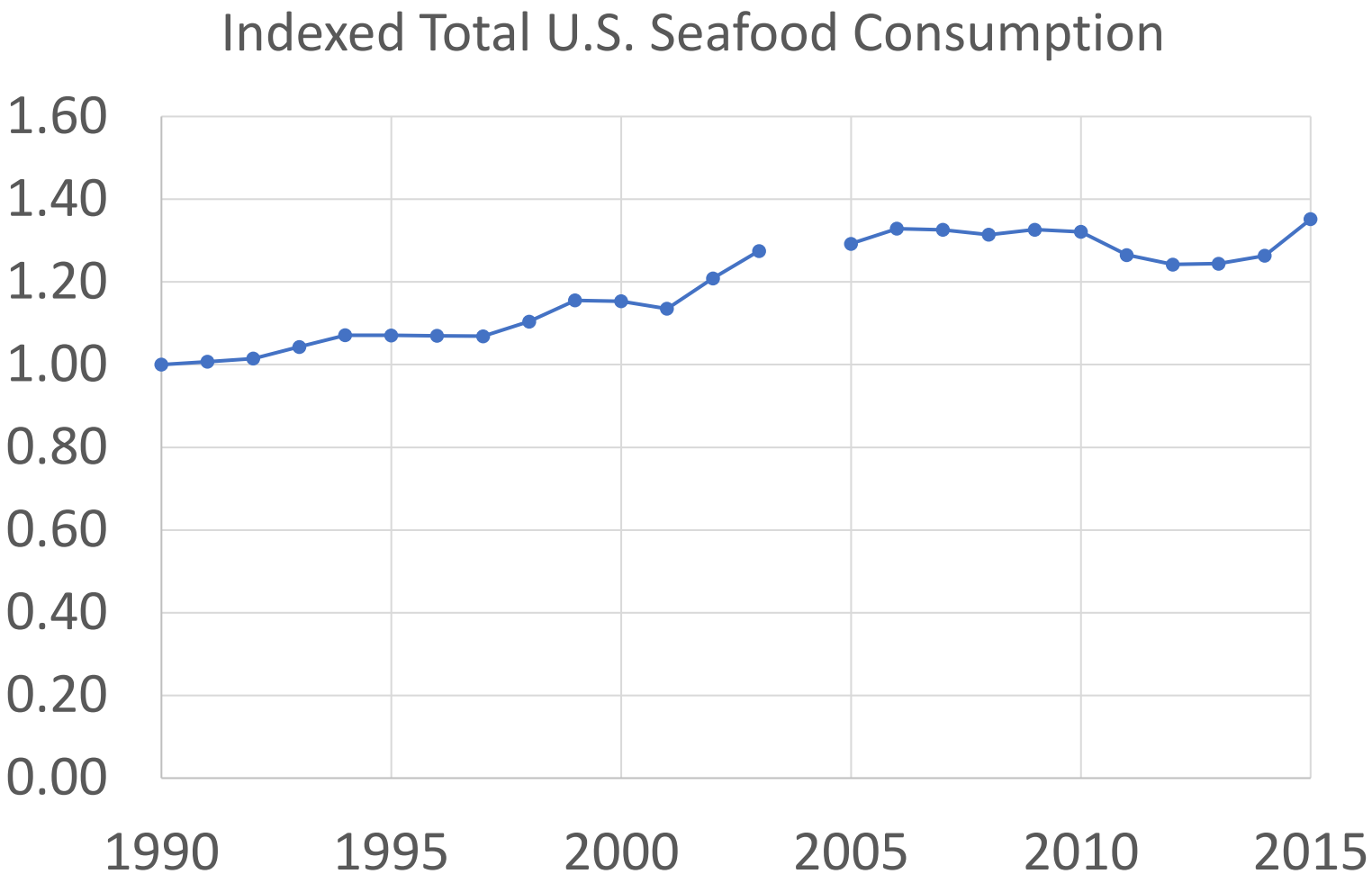


Figure 6 Aquaculture, fish meal, and fish oil production. All production is in million tons, from 1976 to 2017. Fish meal production is indicated by a black line; fish oil production is indicated by a black dotted line. Source: FAO FishStat Plus (https://www.fao.org/fishery/en/statistics/software/fishstat/en).

3. Seafood that people in the U.S. commonly consume has gotten cheaper, or at least has not increased in price, over time

U.S. Seafood Consumption Has Grown Substantially



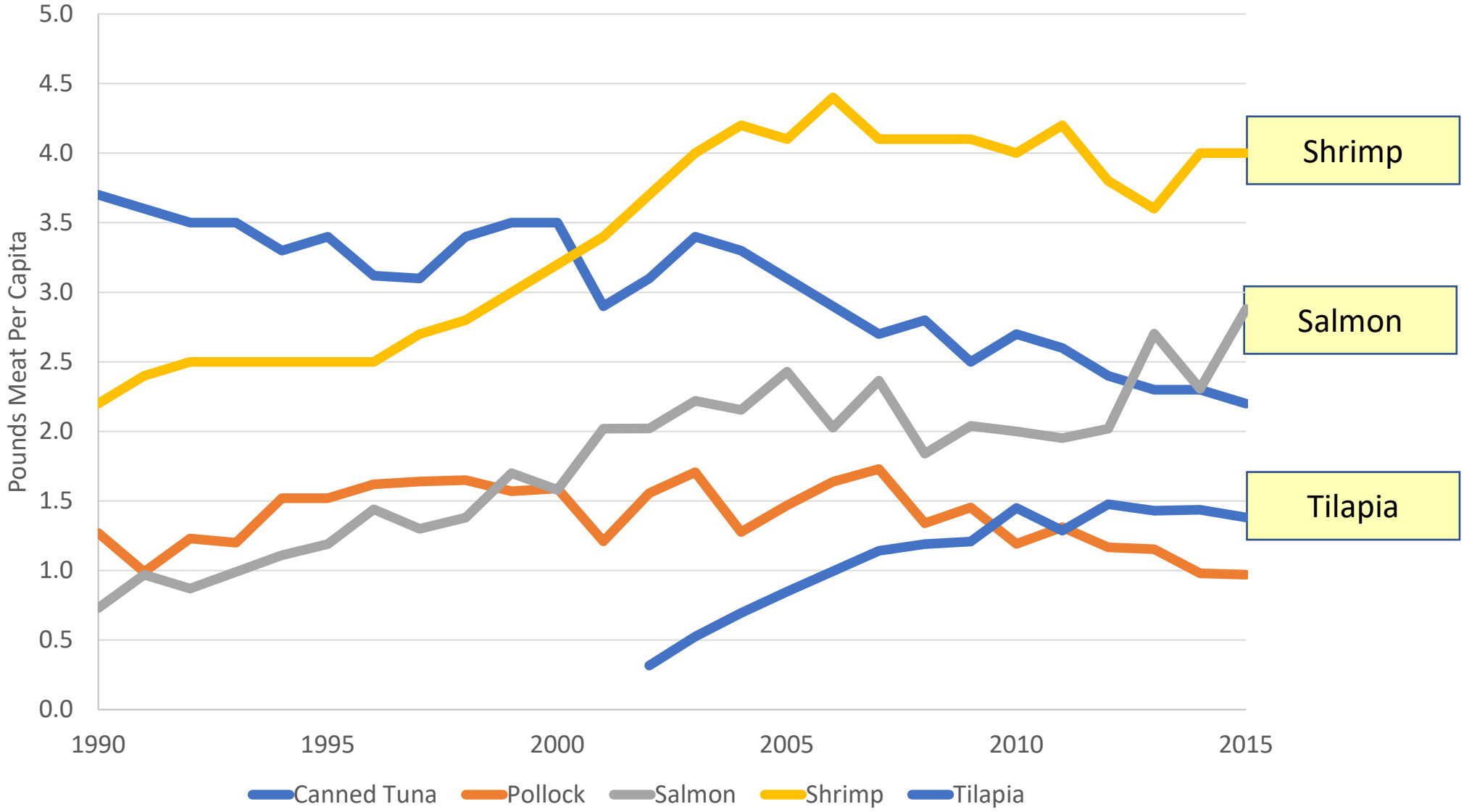
Source: NFI data: US Population estimates

Per Capita U.S. Seafood Consumption (pounds edible meat)

Small number of species are large % of total

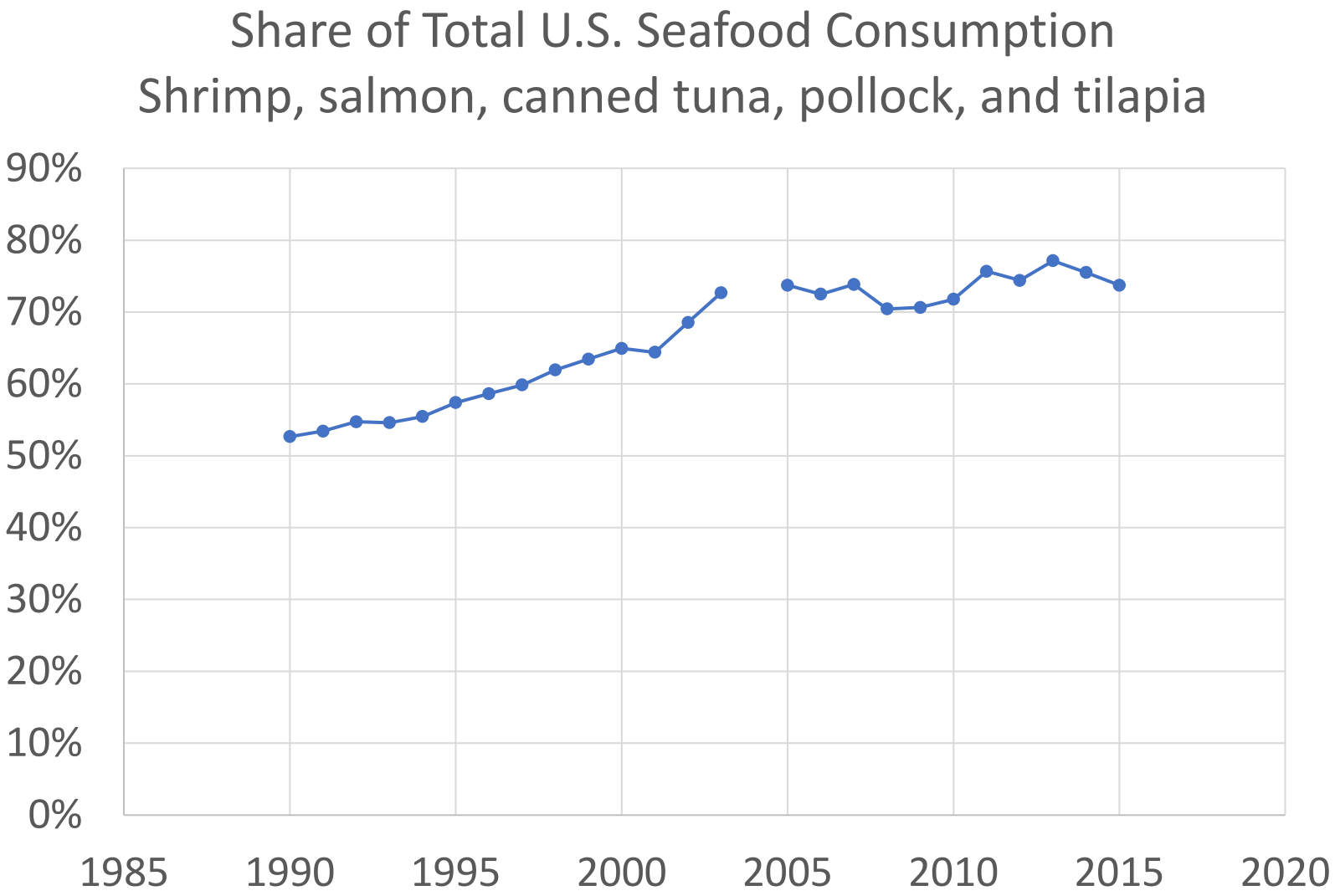
US Per Capita Consumption of Top Seafood products

Source: National Fisheries Institute Data

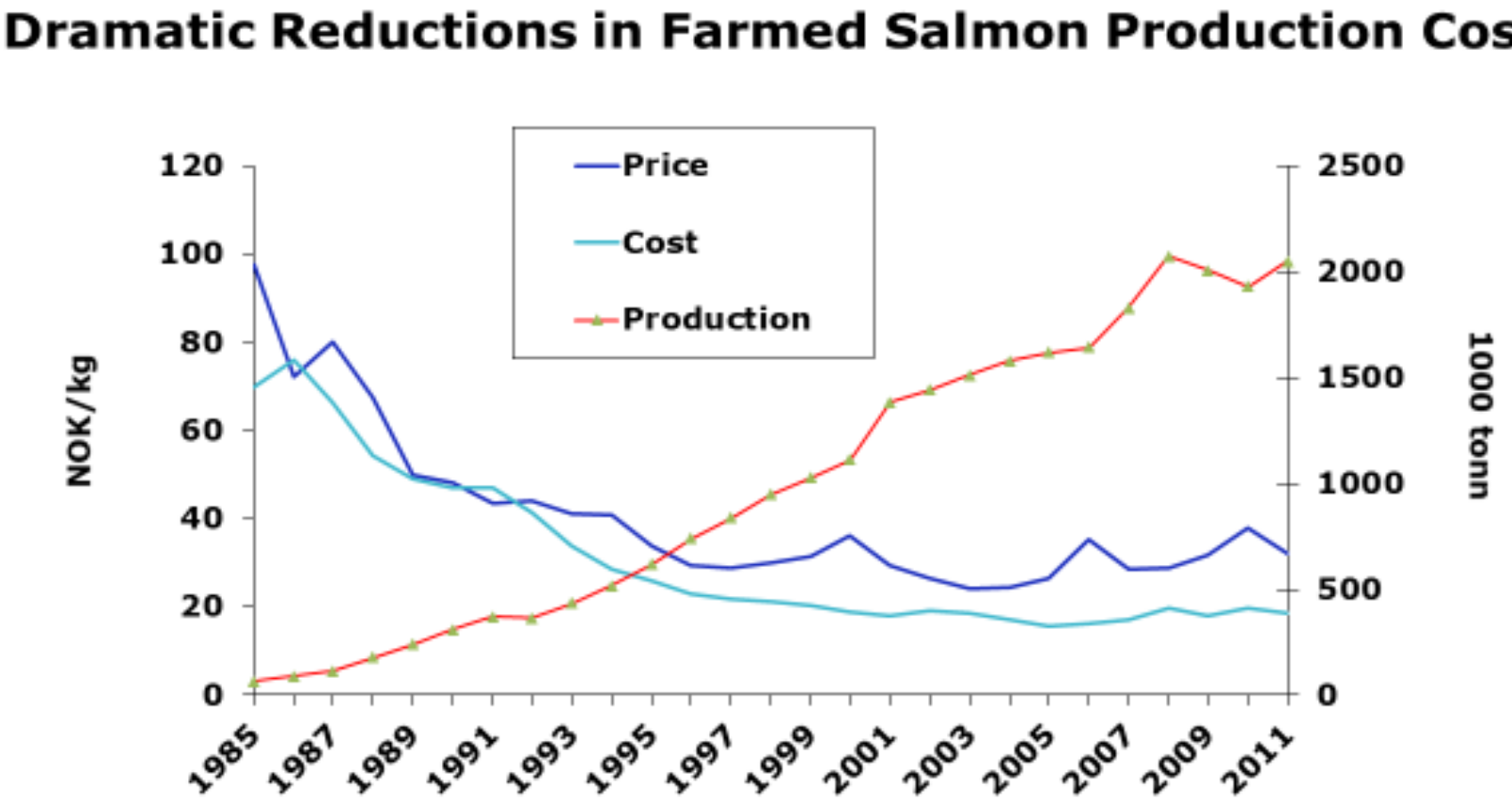


Species trending up are farmed

Top 5 Species are Most of U.S. Seafood Consumption



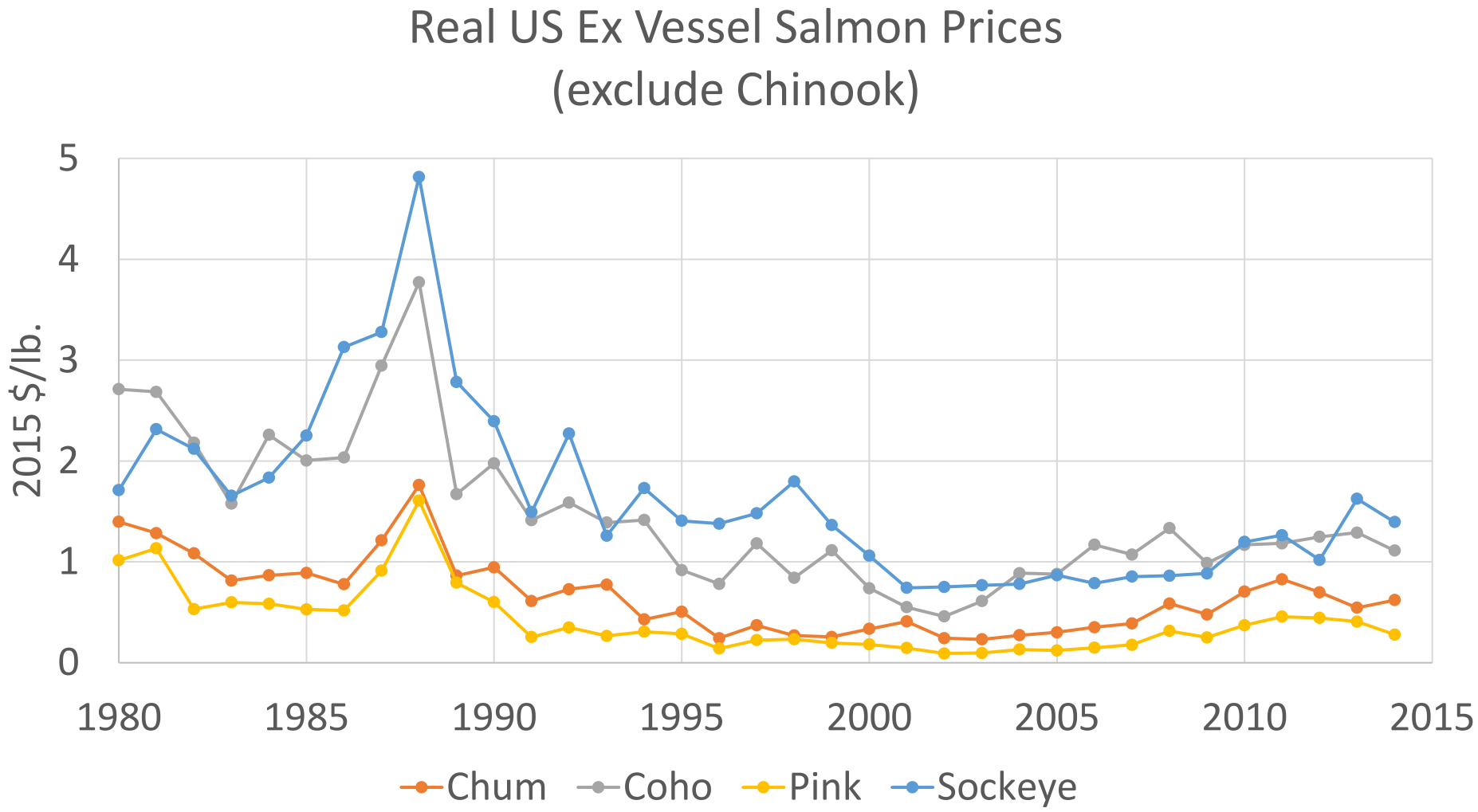
Innovation in Aquaculture = Lower Prices for Consumers



Source: Norwegian Directorate of Fisheries

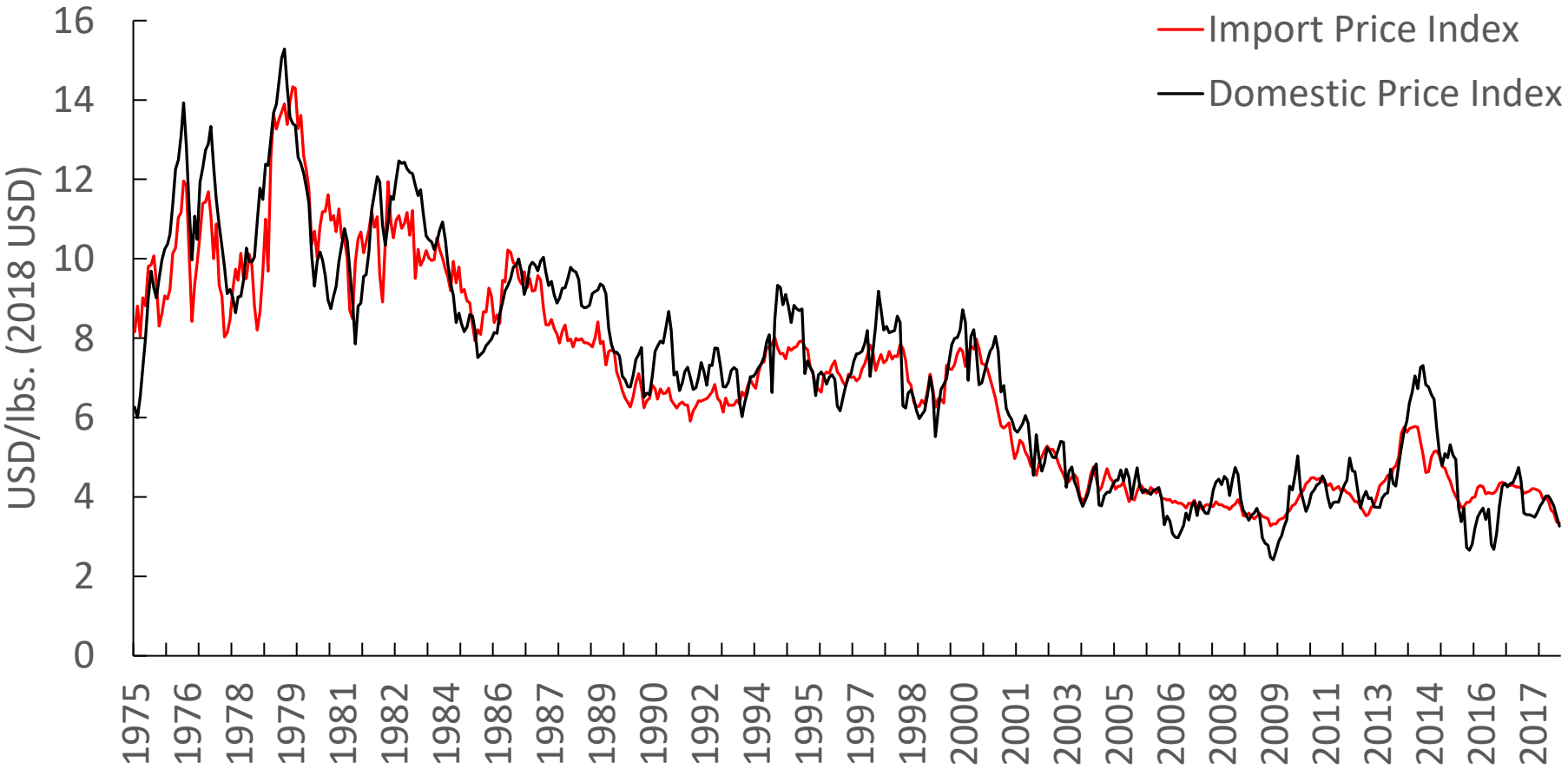
Updated figure based on Asche *MRE* 2008

Wild-caught salmon less expensive than it used to be



Source: Roheim, Asche, and Smith 2016

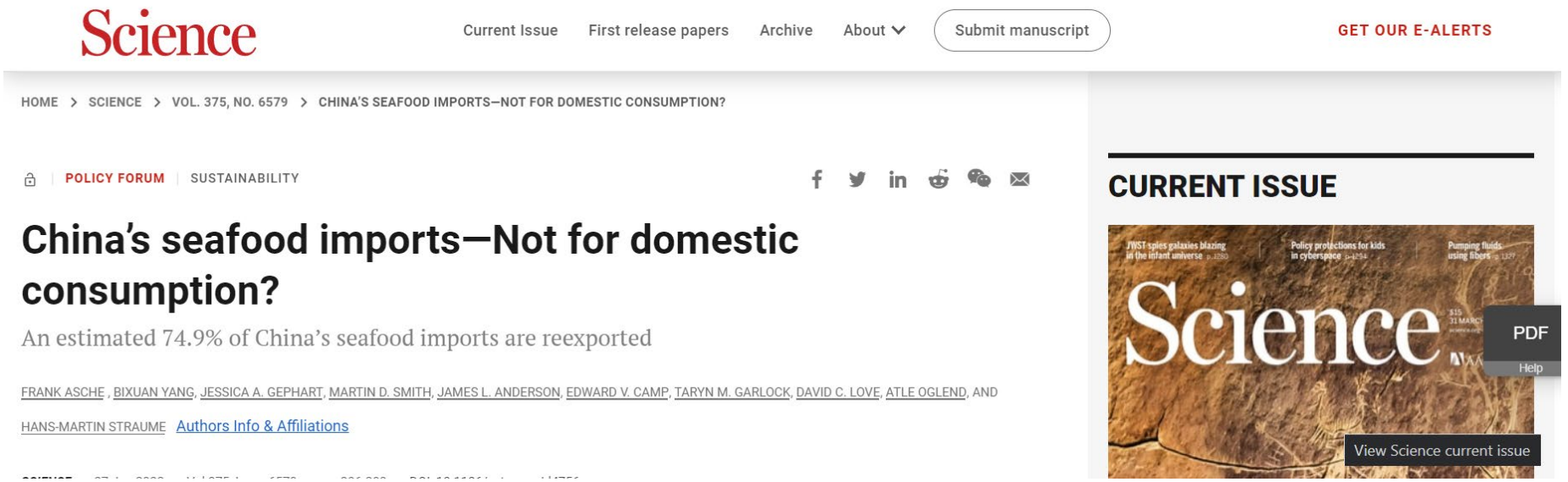
Shrimp a lot less expensive than it used to be



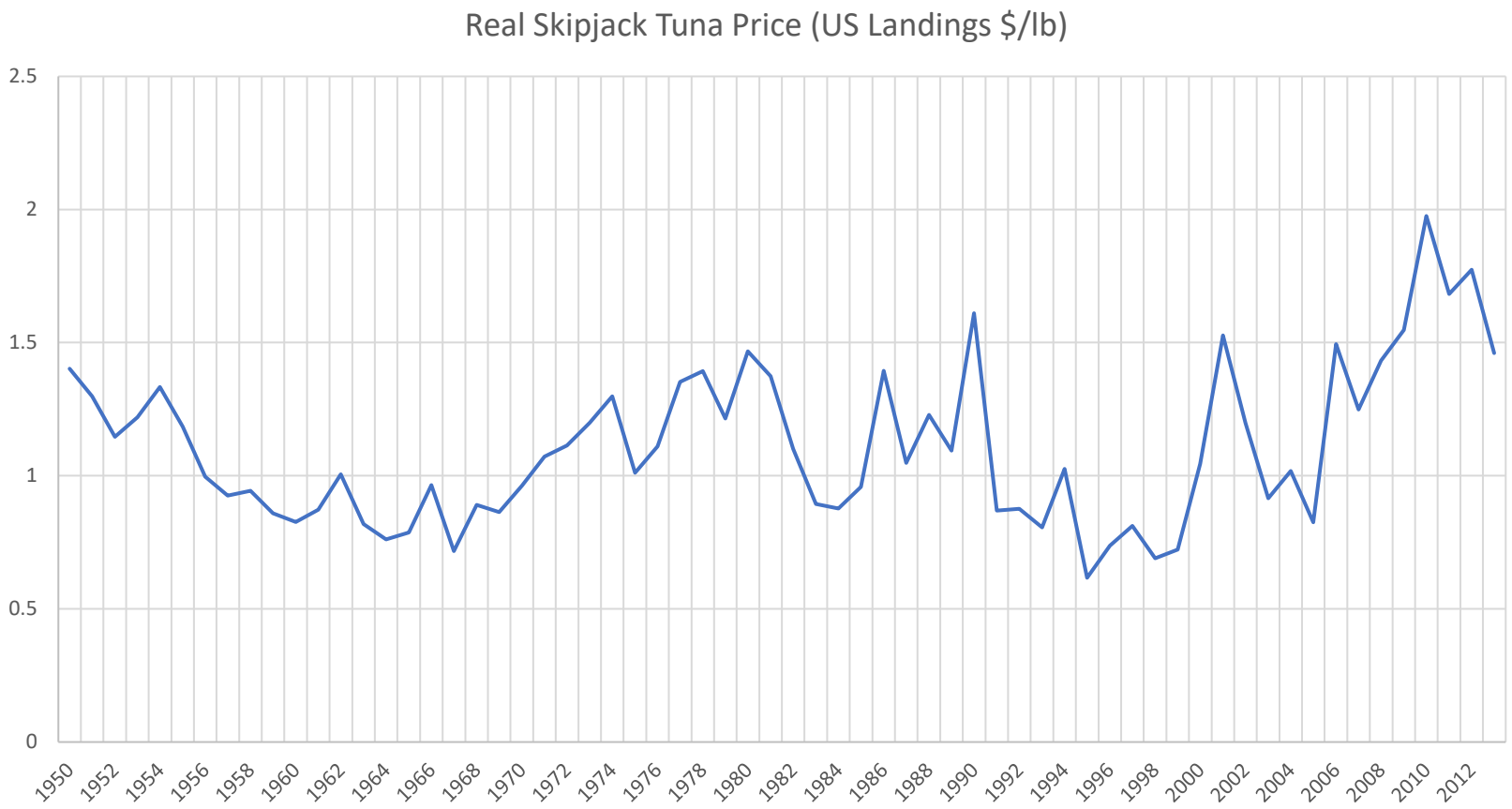
Asche, Oglend, and Smith 2022 *Env Research Letters*

Notes on market developments

- Fresh shrimp and salmon were once high-end products that were only available to middle class and low-income consumers regionally
- Freezing technology has improved dramatically such that frozen is closer to fresh and re-freezing is possible
- Freezing enables re-exporting



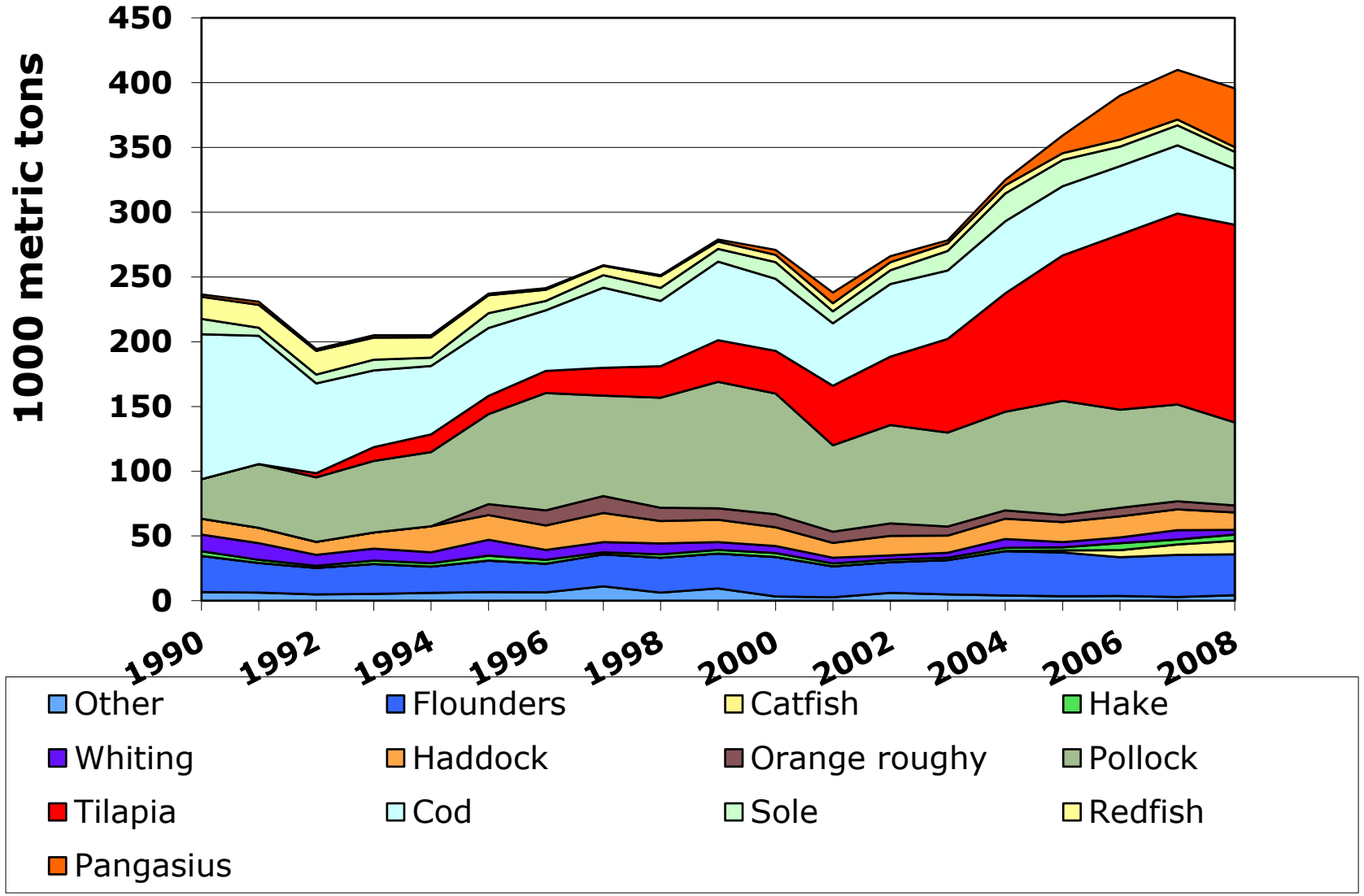
Tuna for canning similar price to 1950



Source: Roheim, Asche, and Smith 2016

US Imports of Frozen Whitefish

Adding new species has grown the global supply of whitefish, also keeping prices down.



Source: NMFS Trade Statistics; Slide courtesy of Frank Asche

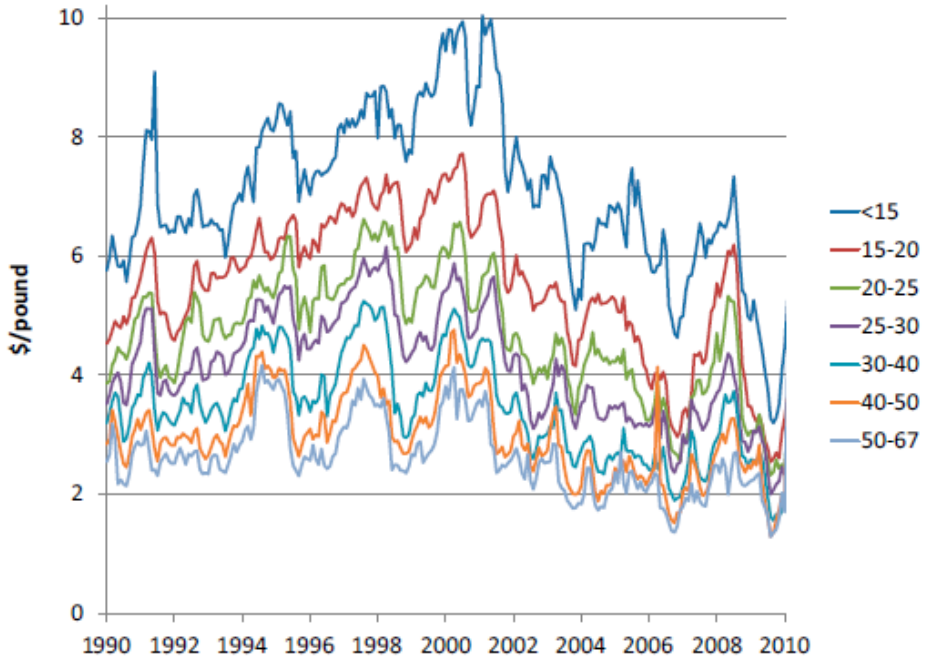
4. Globalization of seafood means access to and affordability of seafood in the U.S. is a function of what is happening around the world

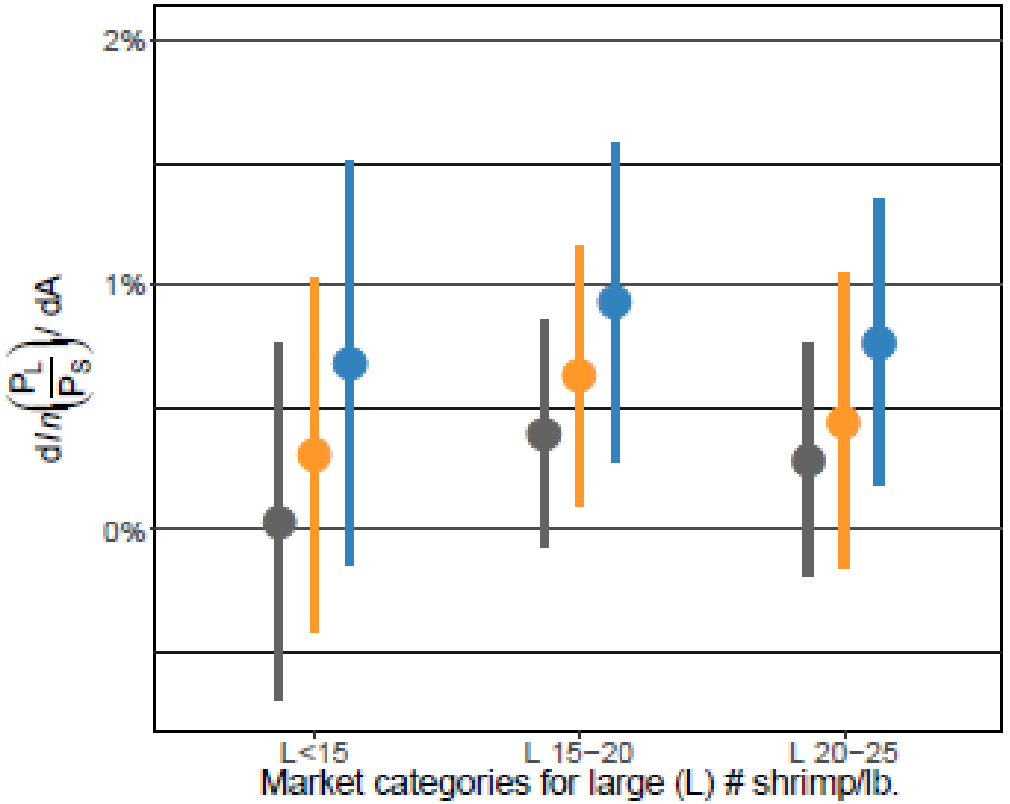
Market integration is ubiquitous in seafood

- **Shrimp**: domestic and imported, multiple countries of origin, warm-water and cold-water, different size categories (Asche et al. 2012; Smith et al. 2017; Ankamah-Yeboah and Bronnmann 2018; Petesch et al. 2021)
- **Salmon**: farmed and wild-caught (Asche et al. 1999)
- **Whitefish**: cod and other major whitefish species (Asche et al. 2004)
- **Tuna**: Guillotreau et al. 2017
- An inland fish market in Namibia integrated with global fish price index (Bronnmann et al. 2020)
- Law of One price after the introduction of mobile phones in small-scale fisheries in Kerala, India (Jensen 2007)
- Tveteras et al. (2012) show between 53% and 98% of seafood globally exposed to international trade competition

Seafood markets are so integrated that **domestic supply shocks lead to small and transient price increases**

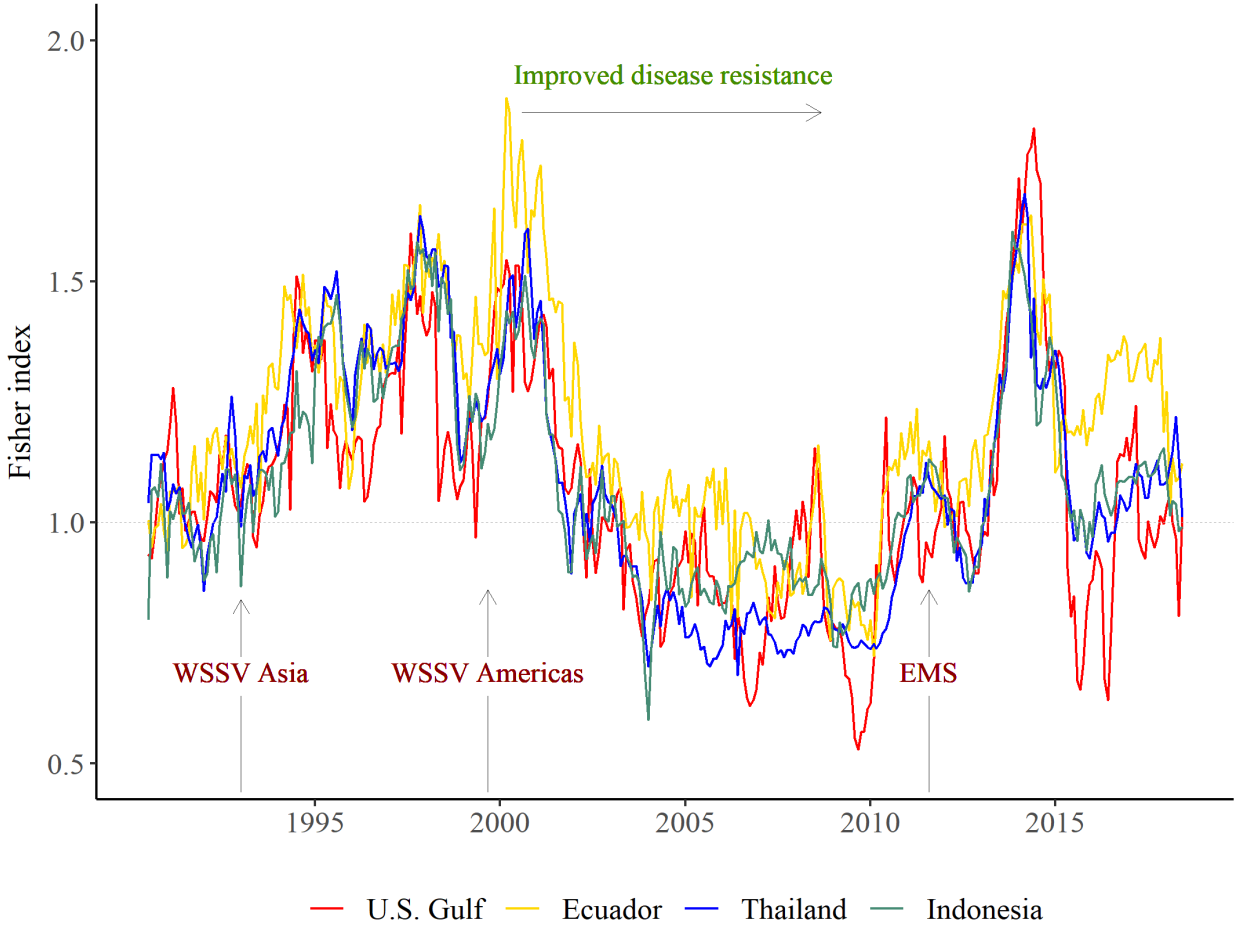
- Hypoxia increases relative prices of large shrimp (imports adjust fast) Smith et al. 2017, *PNAS*





Seafood markets are so integrated that **major global supply shocks lead to substantial price increases that are still short-lived**

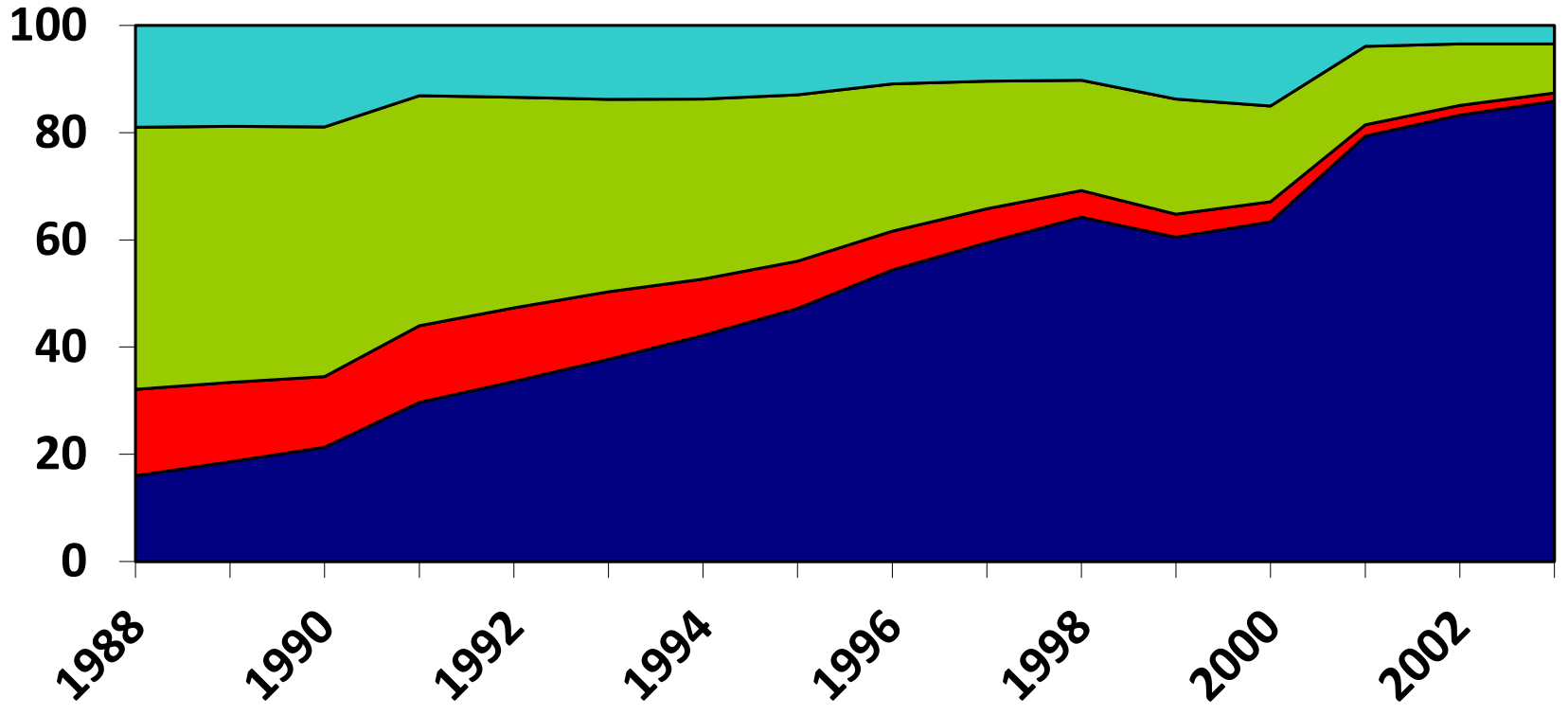
- Shrimp Early Mortality Syndrome massively decreased global shrimp production ~ 2011-15 (imports adjust pretty fast) Petesch, Smith, and Dubik *MRE* 2021



5. How we purchase seafood has changed and reflects broader market trends

Seafood Retail is Changing

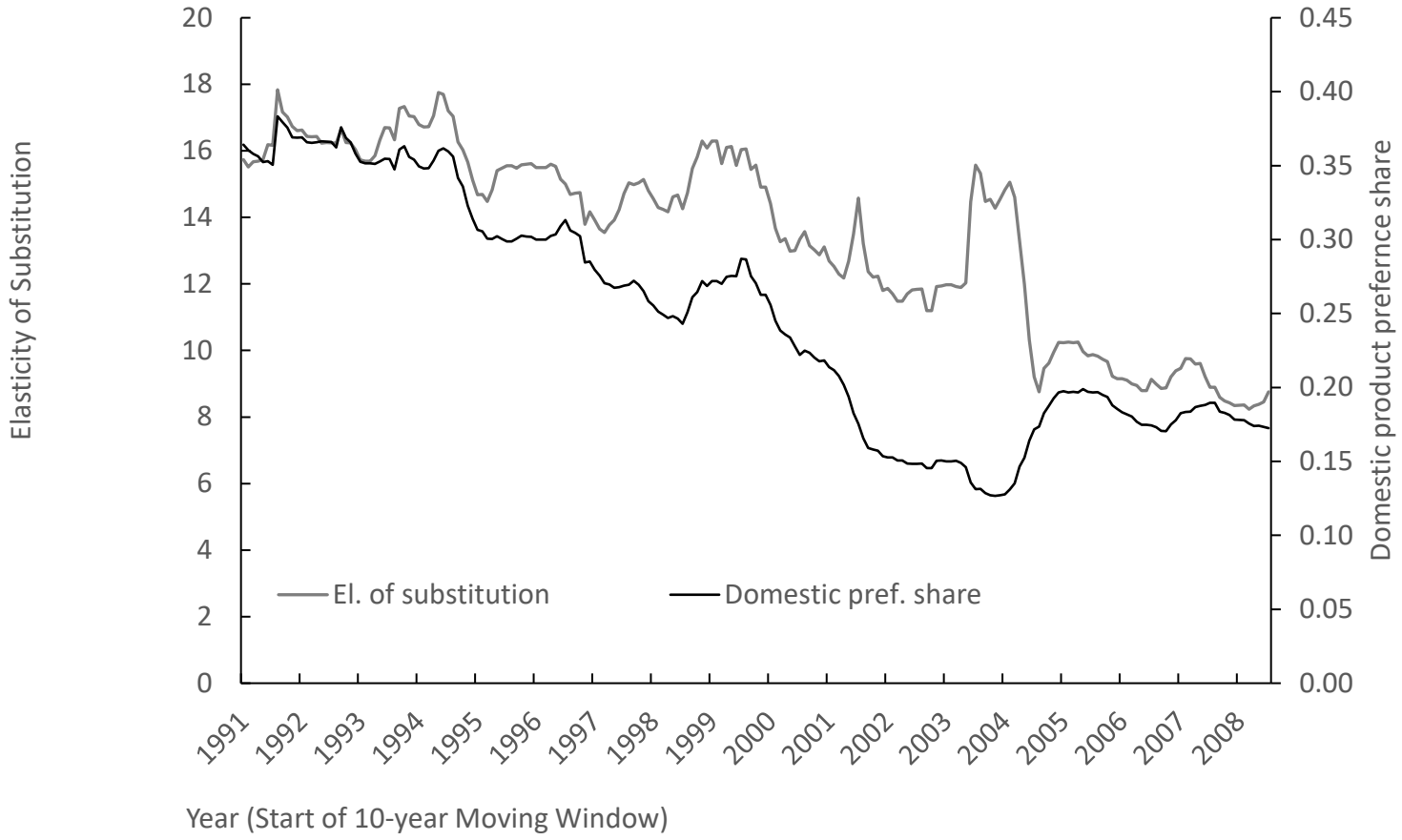
Market Share by Value of Fish in the UK



Source: Sea Fisheries Industry Authority (SFIA)

Slide courtesy of Frank Asche

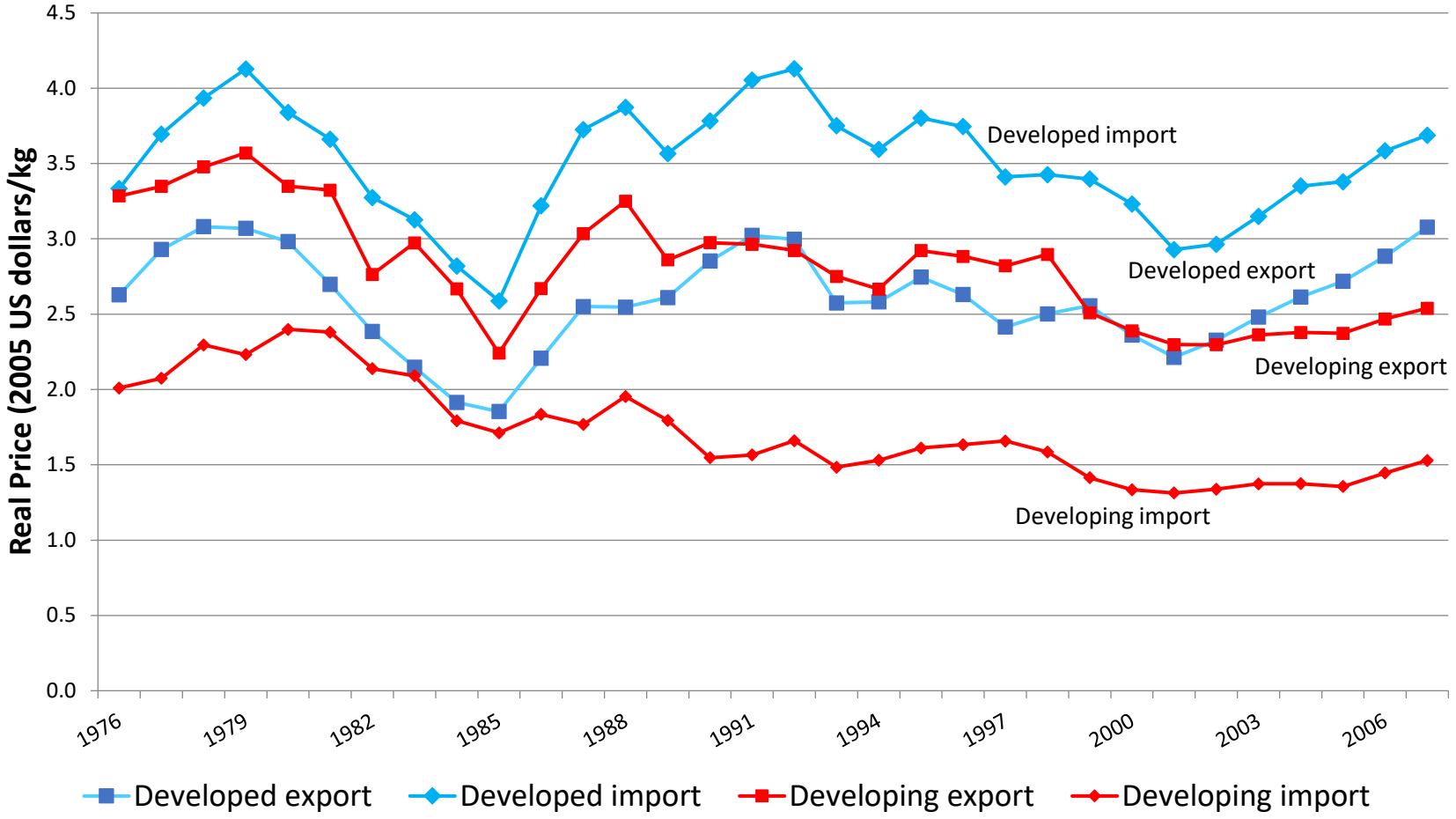
U.S. Shrimp Market Increasing Preference for Imports



Asche, Oglend, and Smith 2022 *Env Research Letters*

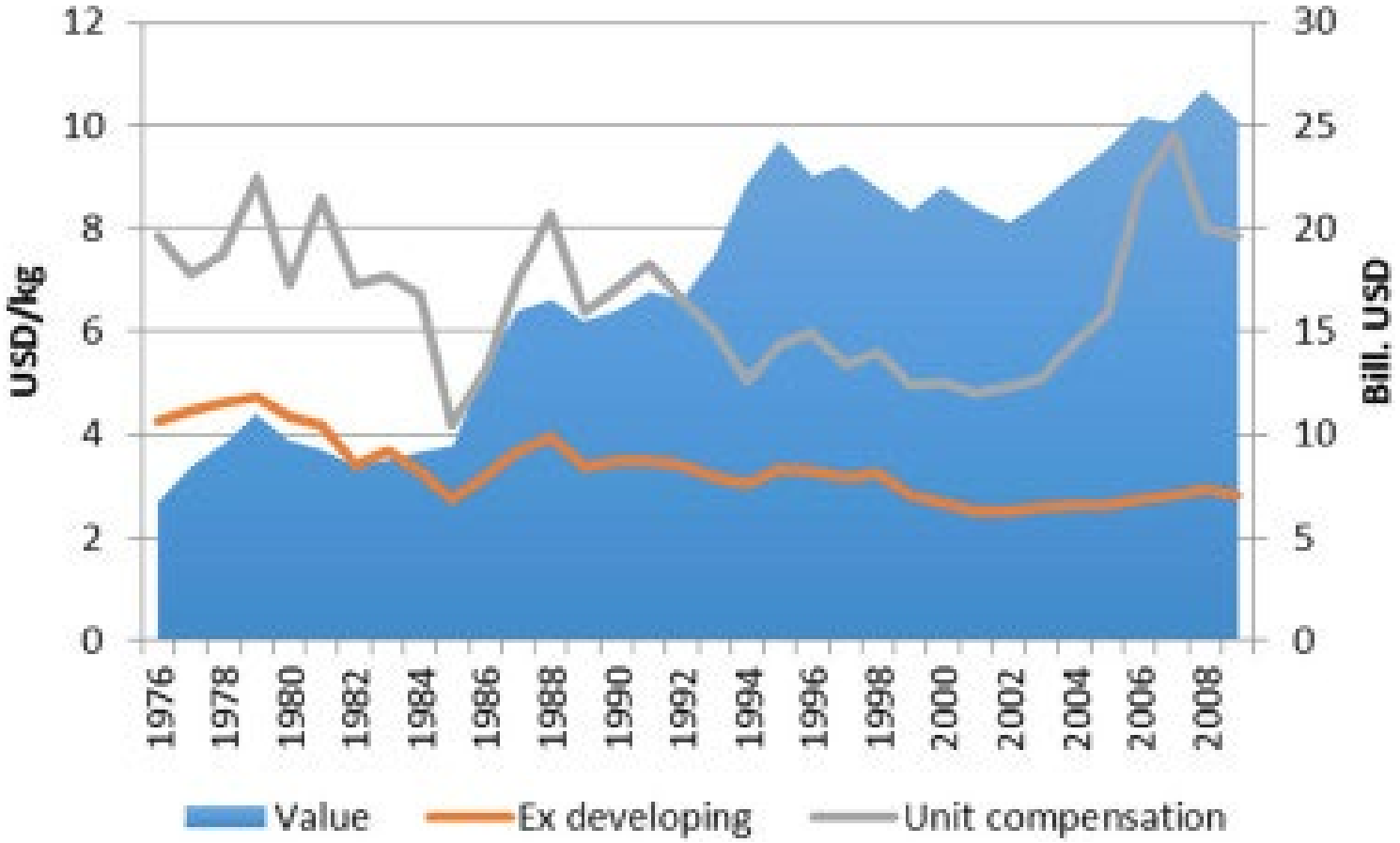
6. U.S. demand is not denying the rest of the world nutrition

Real Unit Prices of Seafood Developing Countries Pay Less



Source: Asche et al. 2015; FAO, FishStat Plus,

Net exports modest, and developing countries highly compensated for them



Asche et al. World Development 2015

In Review

Lower-priced developing country imports are not less nutritionally dense

- Developing nation imported seafood **higher in macronutrients and micronutrients per dollar** compared to developed nation imported seafood
- Differences are explained partly by high-income markets paying premiums for
  - Fresh or live
  - Convenient product forms (e.g., fillet)
  - Other value-added products (e.g., smoked)
  - Specific premium species
  - High trophic level fish

7. Health and sustainability advice about seafood needs to acknowledge opportunity costs

Should I eat fish?

- Most consumer advice is binary as if people are being advised not to smoke
- You have to eat something
- Sustainable is not binary
- Healthy is not binary
- What would you eat instead?
  - Flax-encrusted tofu
  - A cheeseburger

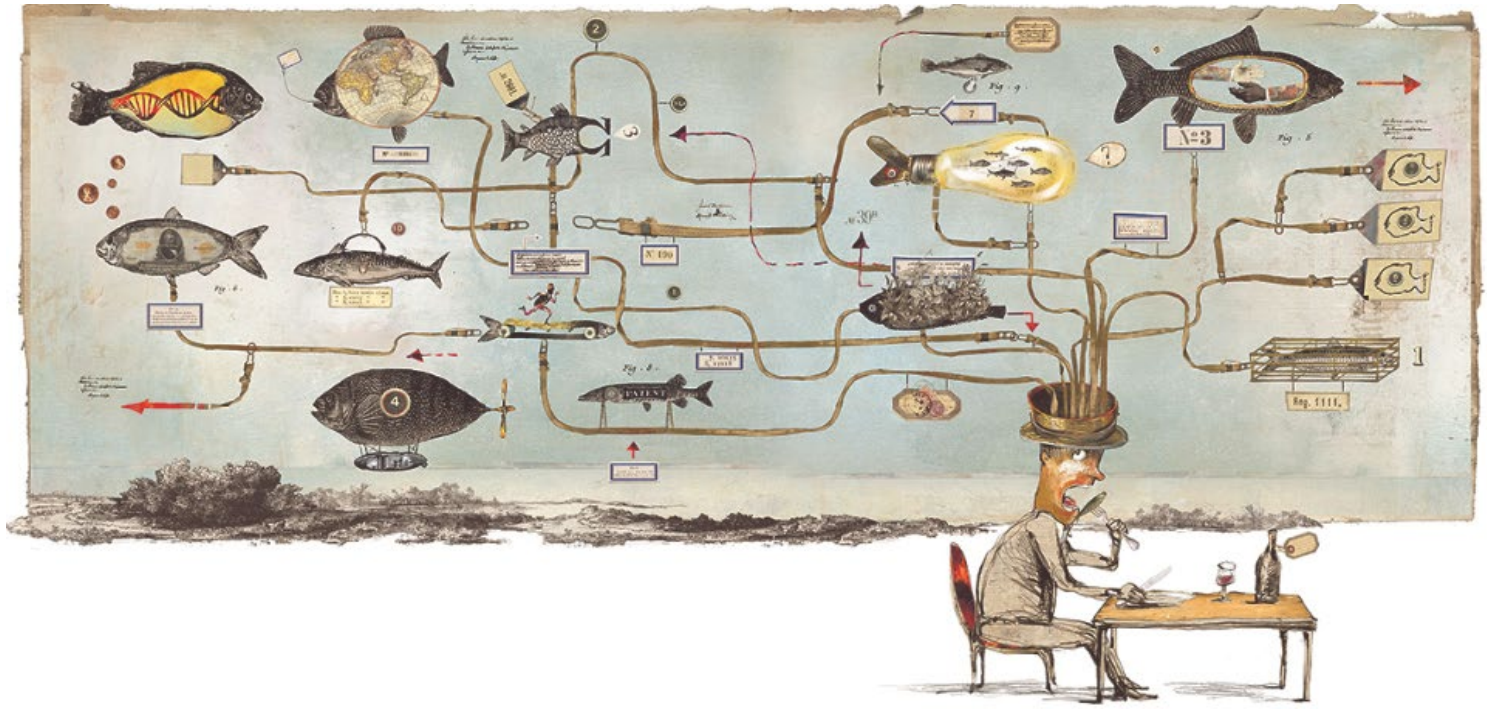


Illustration Artist: Bruno Mallart


Thank you!

Extras

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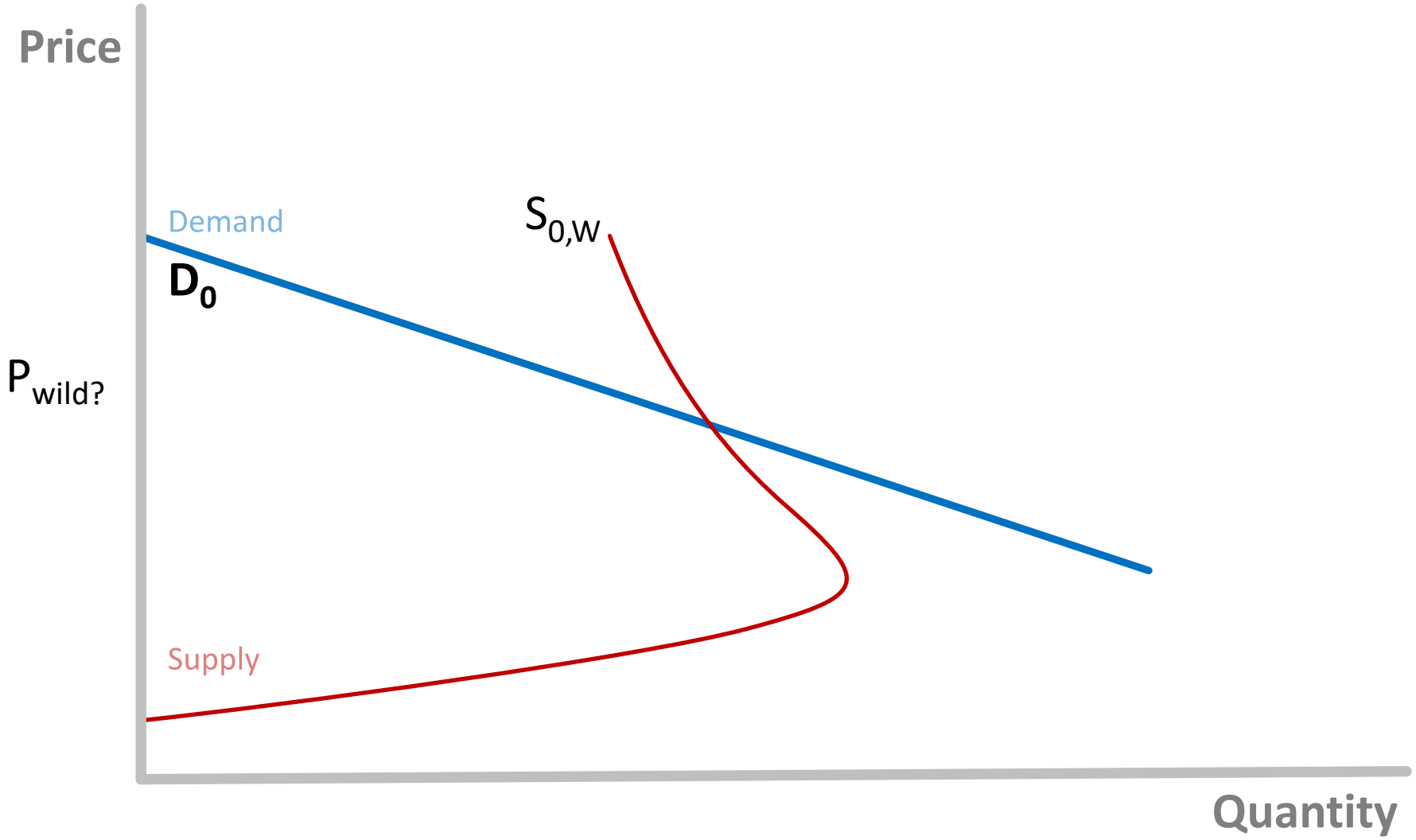
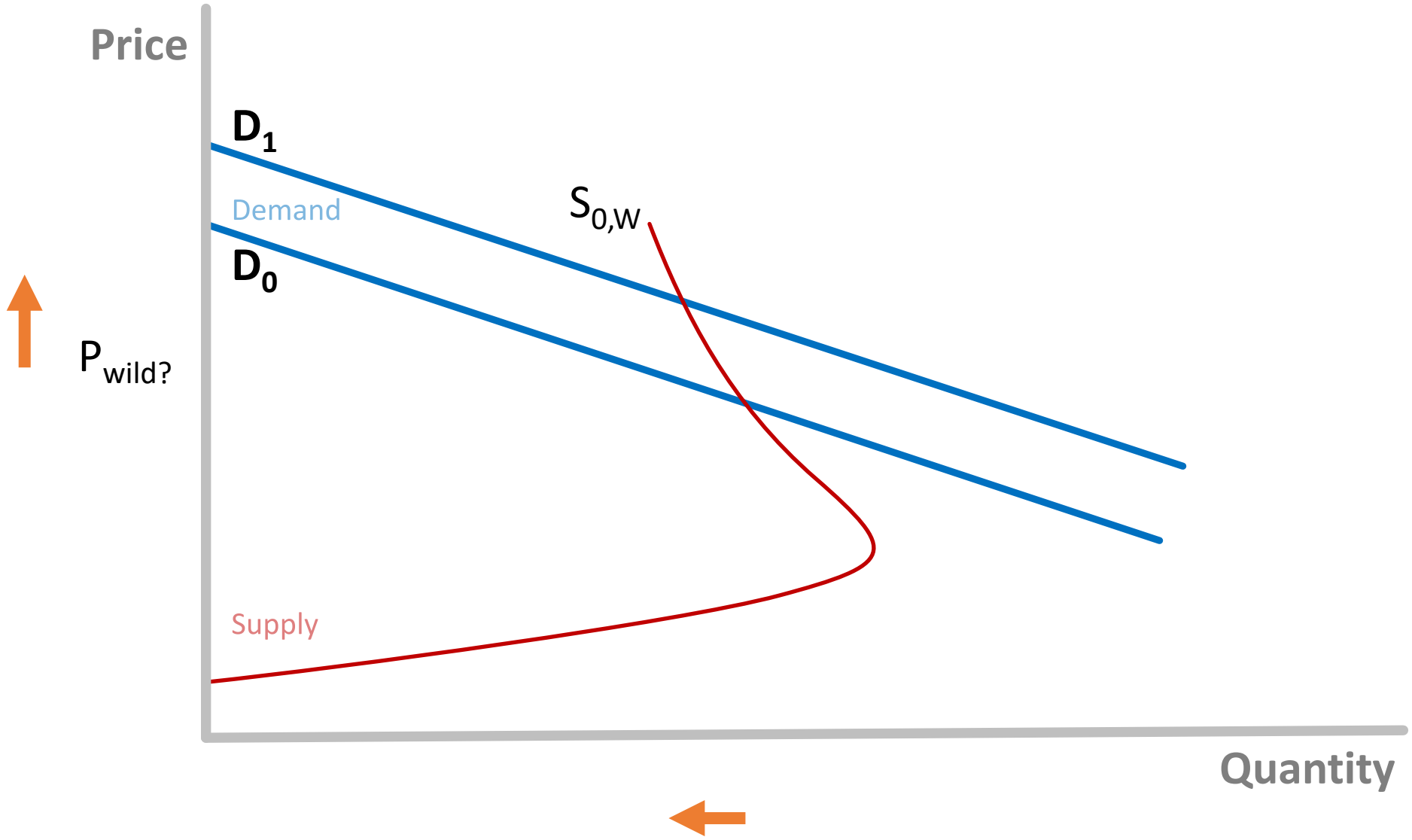
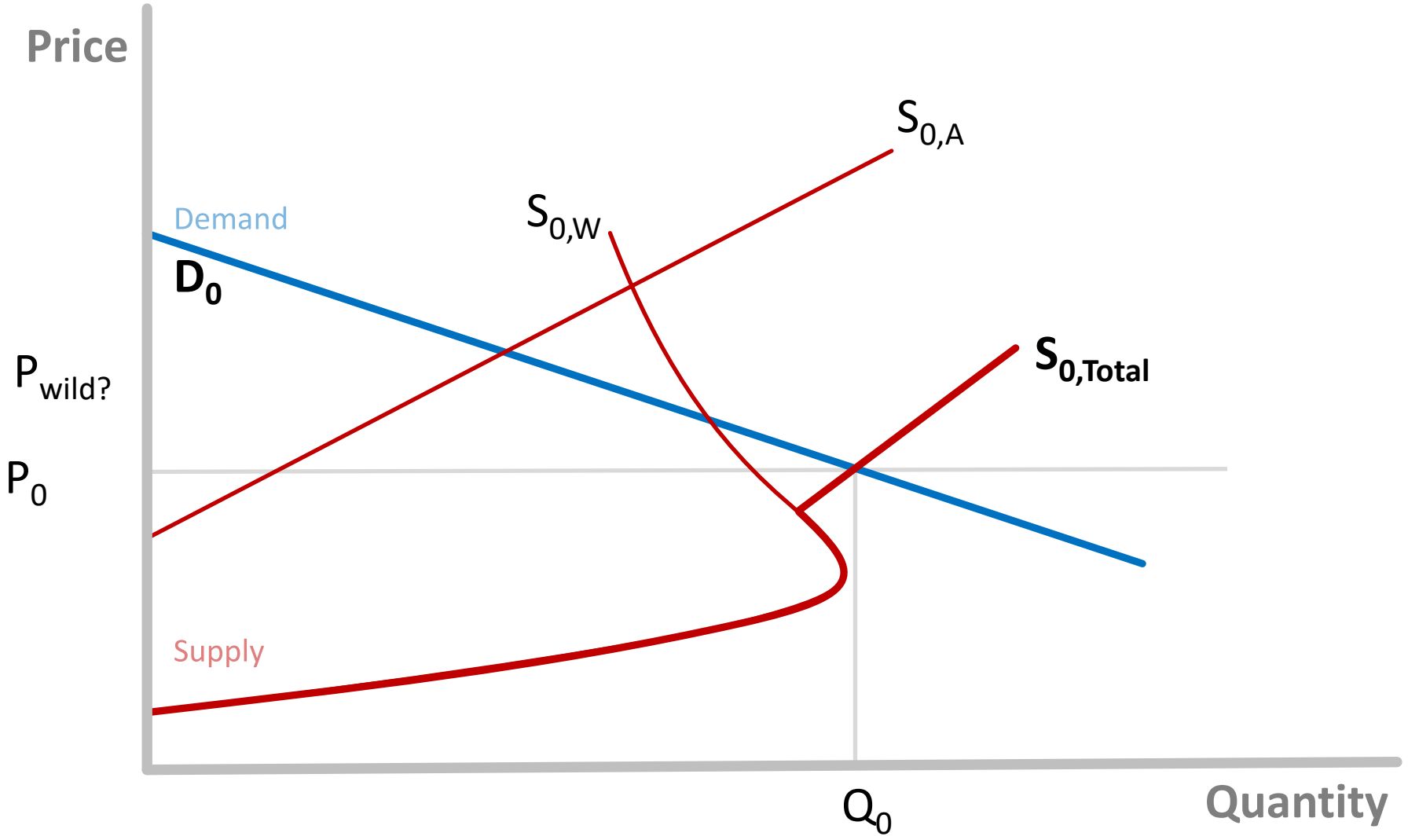
The Econ 101 Story (1)



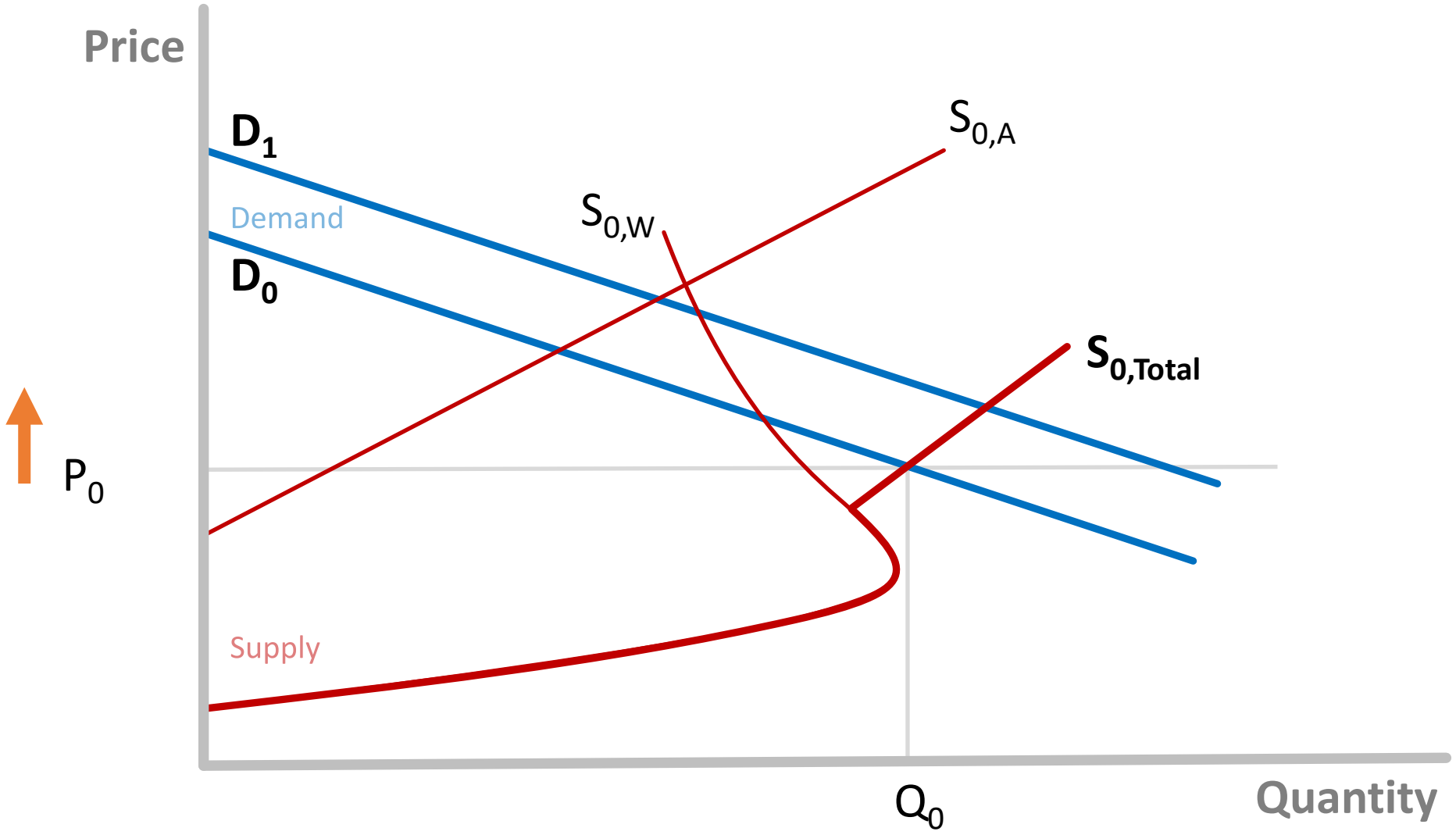
The Econ 101 Story (2) – Higher Price and Lower Quantity, **BUT IT DIDN'T HAPPEN**



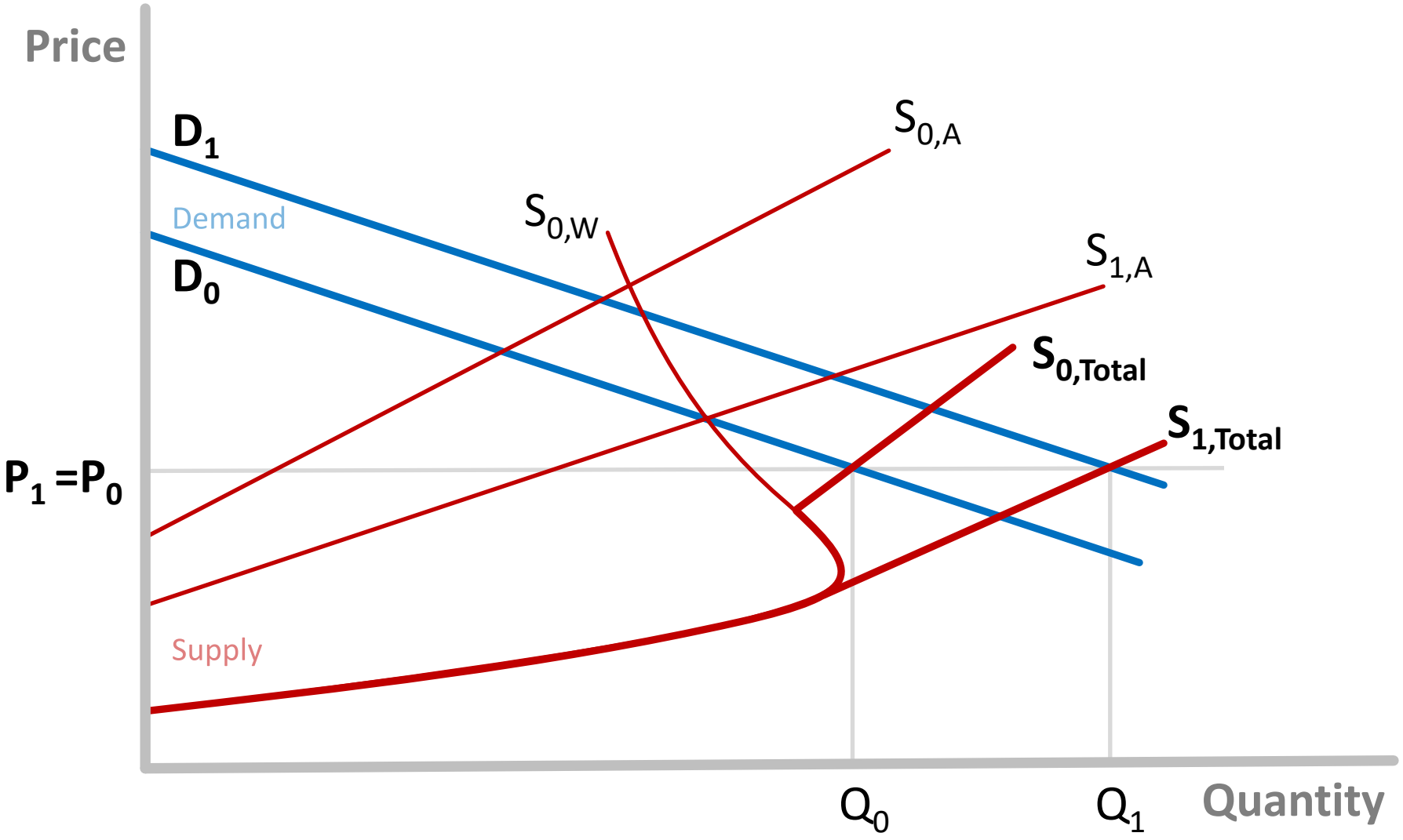
The Econ 101 Story (3) - Add Aquaculture



The Econ 101 Story (4) – Higher Price, **BUT IT DIDN'T HAPPEN**



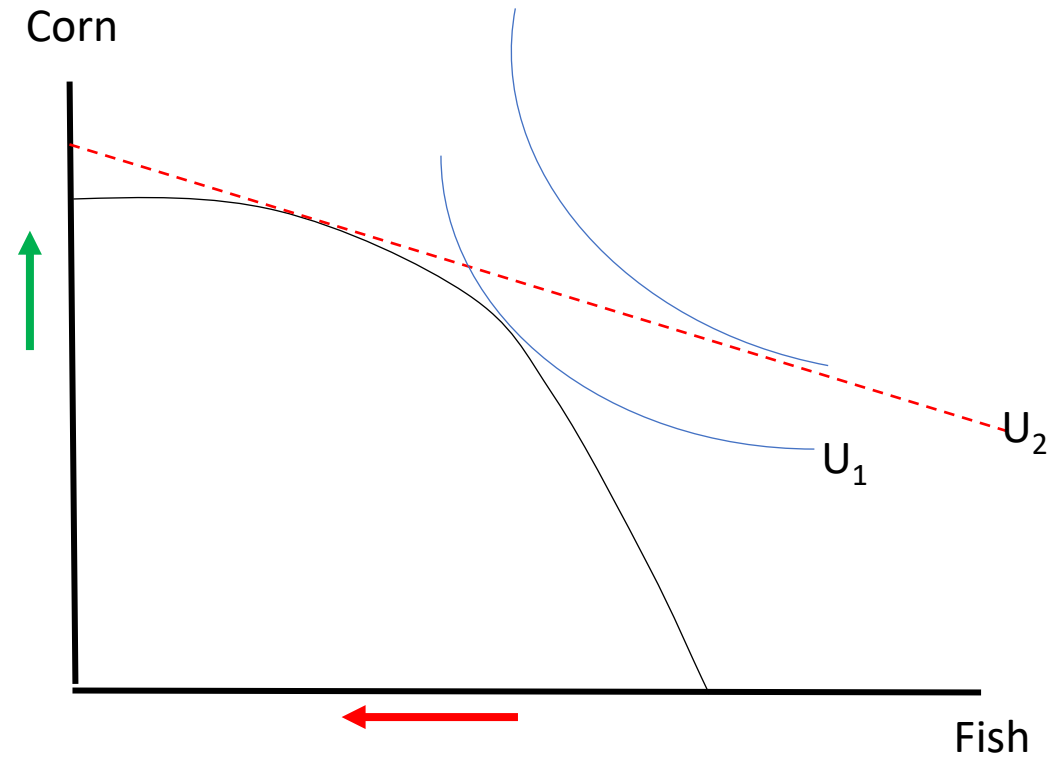
The Econ 101 Story – What did happen



There is no reason that each sector of an economy should run a trade surplus

In fact, basic economics teaches us just the opposite – some sectors will run a surplus and others a deficit

U.S.



Some other country