

**Markets and Marketing of Aquaculture and Fisheries Products: Analysis of Store-Level Scanner Data from the United States**



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# Overview/Introduction

# U.S. seafood imports 2013: 2.5 million tons

> 90%

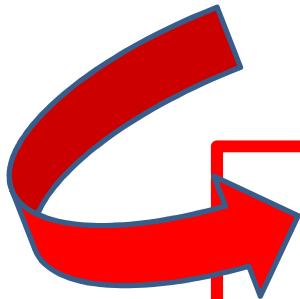
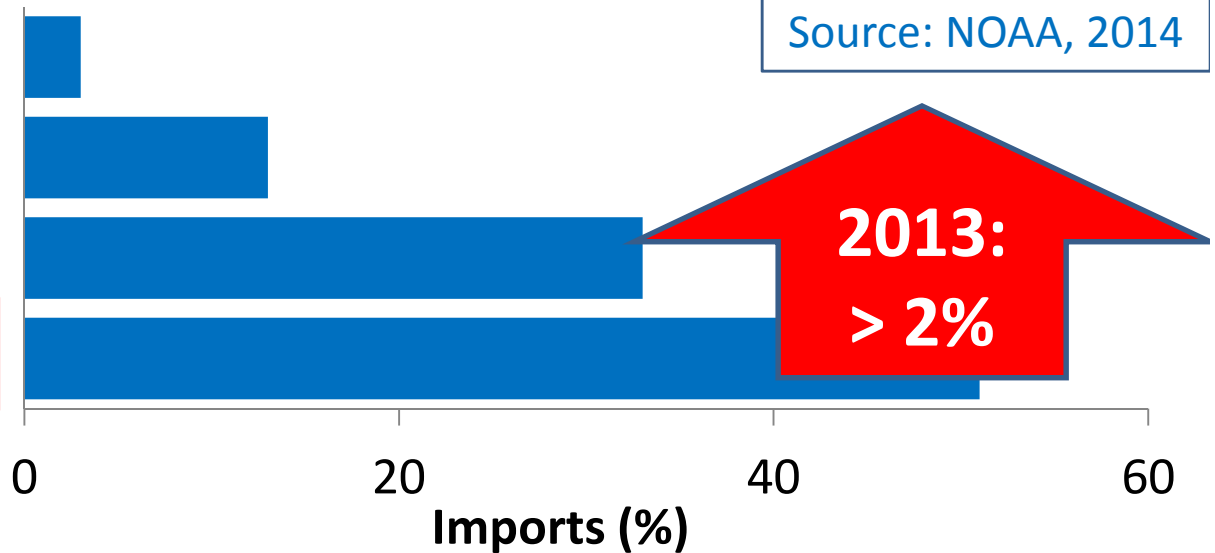
Source: NOAA, 2014

Other: caviar, seaweed....

Canned finfish & shellfish

Fresh & frozen shellfish

Fresh & frozen fish

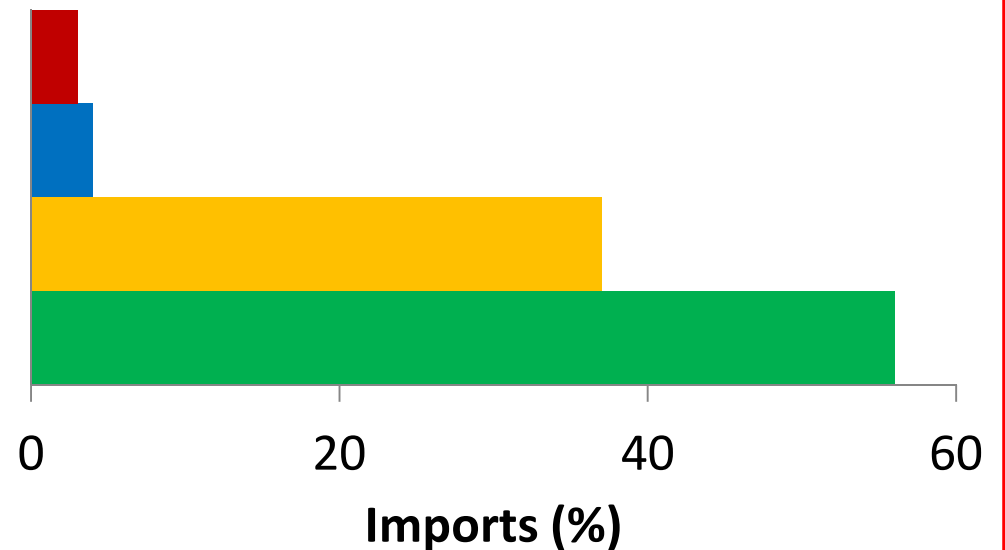


Other: minced....

Block

Whole

Fillet and steak



Source: NOAA, 2014

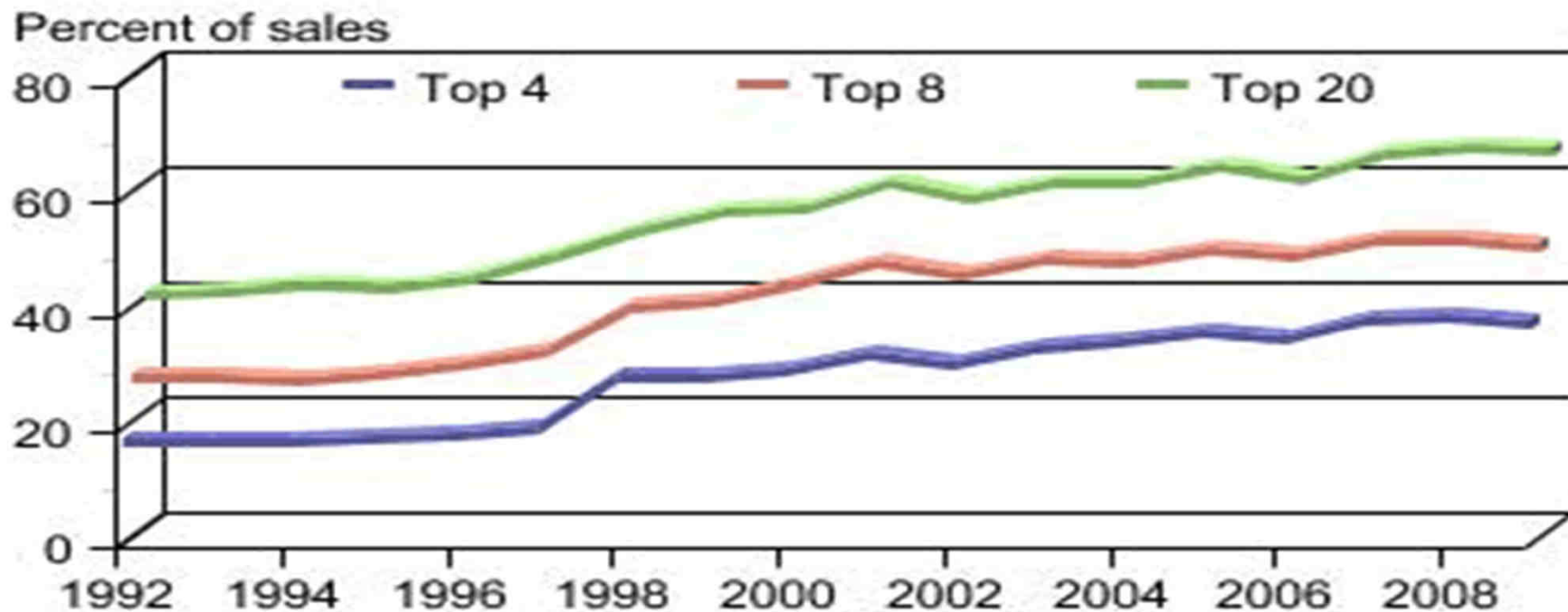




Grocery store

## Top 4, 8, and 20 firms' share of U.S. grocery store sales, 1992-2009

Divestitures and internal growth contributed to rising shares in recent years



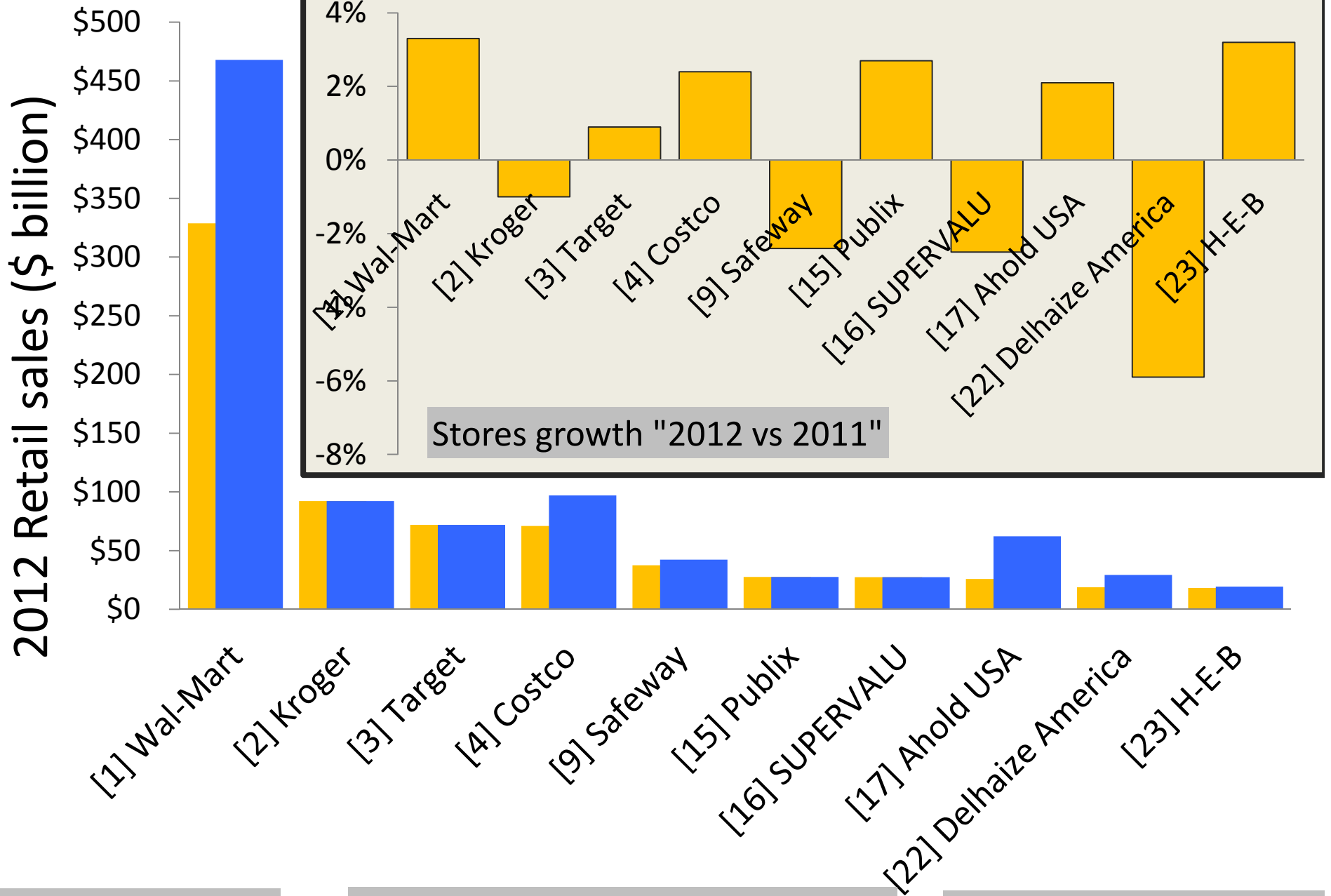
Note: Sales based on North American Industry Classification System (NAICS).



Source: USDA, ERS calculations using data from U.S. Census Bureau, Monthly Retail Trade Survey, 1992-2009; and company annual reports.

Source: Roheim, 2014





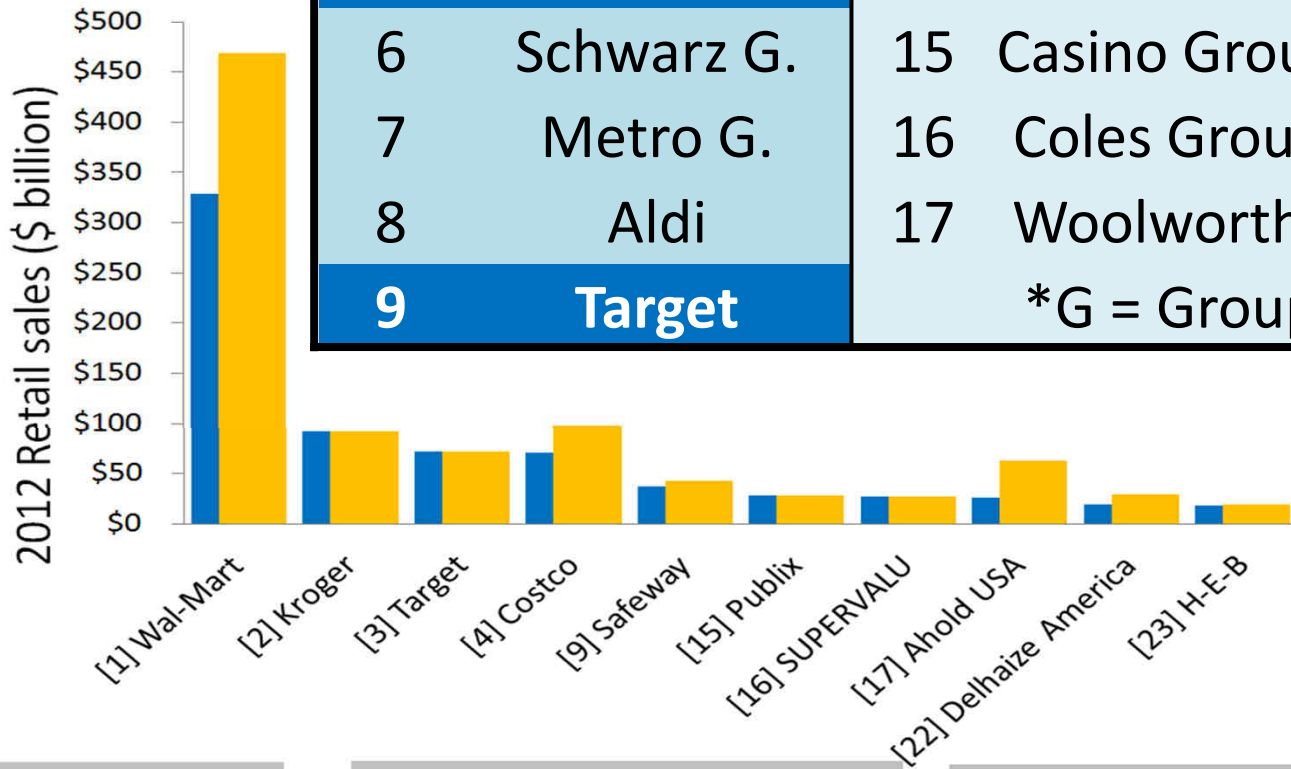
■ U.S.  
■ Worldwide

[ ] denotes rank in the U.S. Top 100 retailers 2013

Source: National Retail Federation, 2014

# TOP 25 global retailers 2013

Rank	Company	Rank	Company	Rank	Company
<b>1</b>	<b>Wal-Mart</b>	10	AEON	18	ITM
2	Tesco	11	Rewe Group	19	Leclerc
3	Carrefour	12	Seven & I	<b>20</b>	<b>Safeway</b>
<b>4</b>	<b>Costco Co.</b>	13	Auchan	<b>21</b>	<b>Ahold</b>
<b>5</b>	<b>Kroger Co.</b>	14	Edeka	22	Sainsbury's
6	Schwarz G.	15	Casino Group	<b>23</b>	<b>Supervalu</b>
7	Metro G.	16	Coles Group	24	Loblaw Cos.
8	Aldi	17	Woolworths	<b>25</b>	<b>Delhaize G.</b>
<b>9</b>	<b>Target</b>		*G = Group		



■ U.S.  
■ Worldwide

[ ] denotes rank in the U.S. Top 100 retailers 2013

Source: National Retail Federation, 2014

# A.C. Nielsen + Information Resources Inc.



Information collected through the scanning of UPC/BAR CODES



52 markets Scantrack: (i) food stores >\$2million in sales  
(ii) drug stores and mass merchandise >\$ million in sales

Supermarkets



Mass Merchandisers



Independent Food Stores



Gas Convenience Stores



Supercenters



Chain Convenience Stores



Drug Stores

# At the retail level...

Seafood products can further be differentiated by different combinations of product attributes:

- ✓ species
- ✓ brand
- ✓ product form
- ✓ processing form
- ✓ packaging size
- ✓ .....





2009: Wal-Mart stores started to participate in the A.C. Nielsen scantrack program

## **Expanded All Outlets Combined (xAOC) ScanTrack**

includes other key retailers & channels such as:

- ✓ Wal-Mart
- ✓ warehouse club (Sam's and BJ's),
- ✓ dollar stores (Dollar General, Family Dollar )
- ✓ military/DECA

# Dataset: Without Walmart Stores 2005-2010



# Store Covered

- From 133 “Food Chains”

Kroger

Food lion

Publix

Safeway

Albertsons (sv)

Winn dixie

Save a lot corpora

Piggly wiggly caro

Stop & shop

Vons

Heb

Ralphs grocery

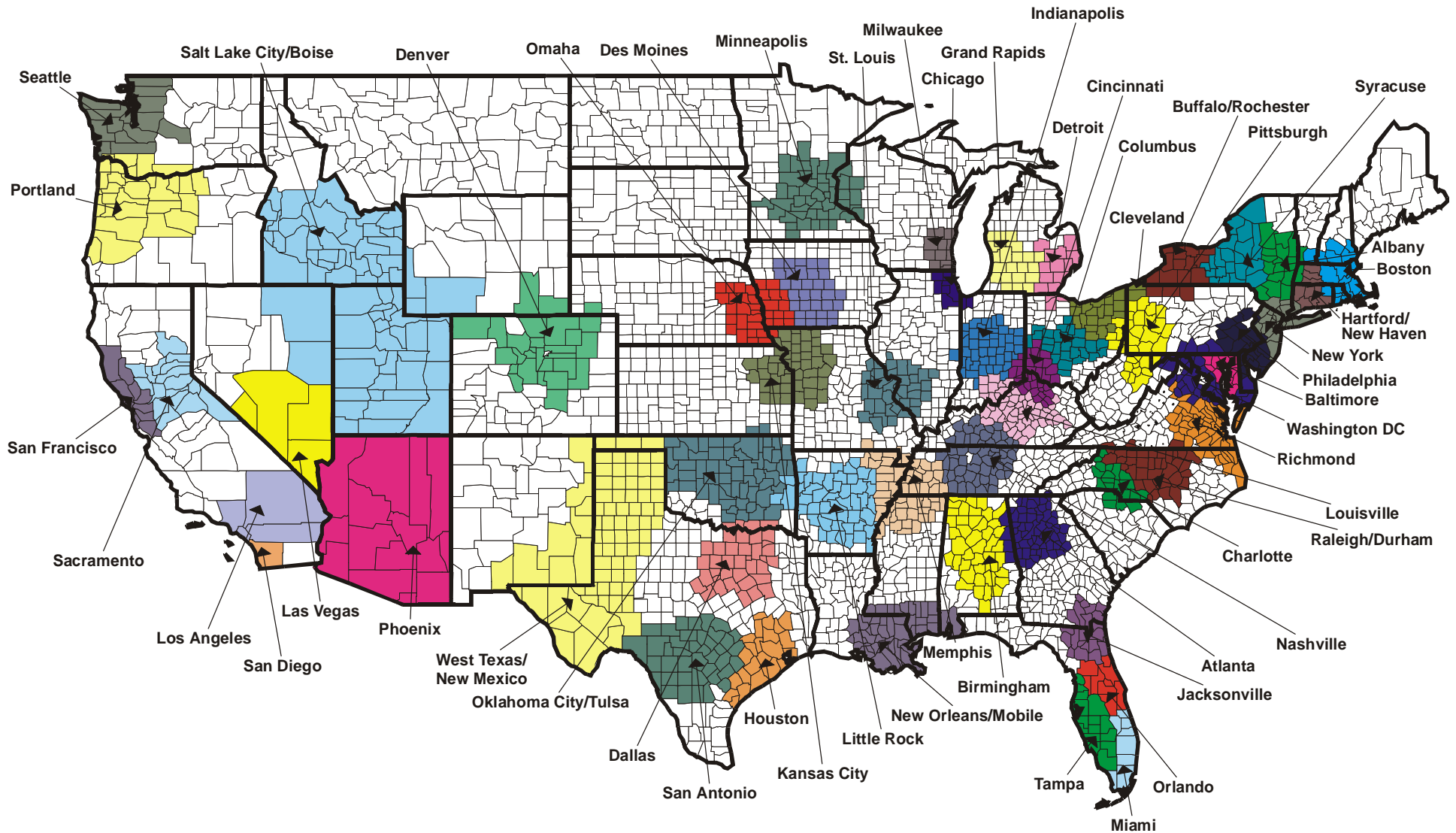
Houchens/save-a-lo

Albertsons (cerb)

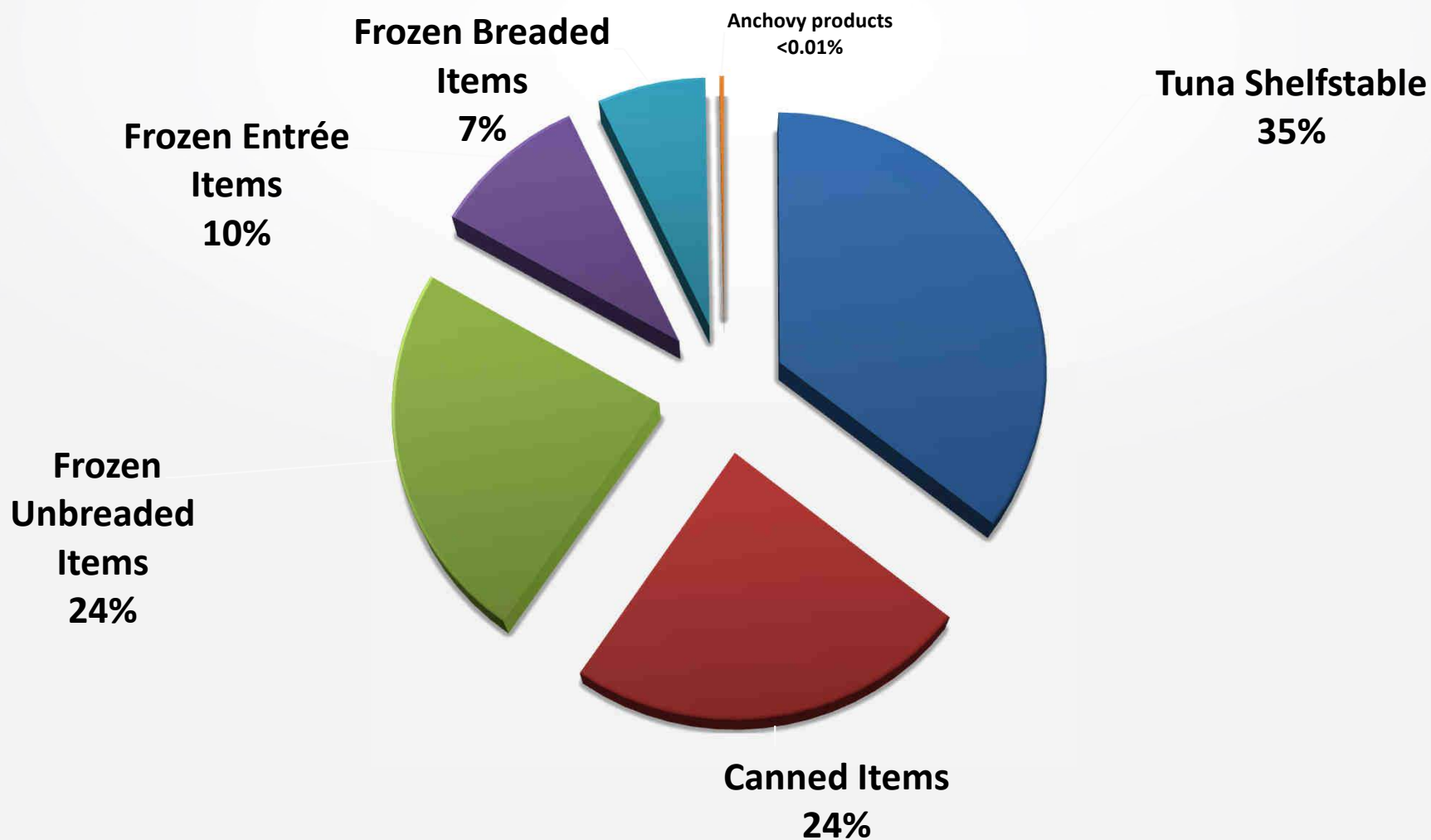
**NOT Walmart**



# Markets Covered



# Composition of retail seafood sales



# The three frozen/chilled seafood categories

## Value-added products

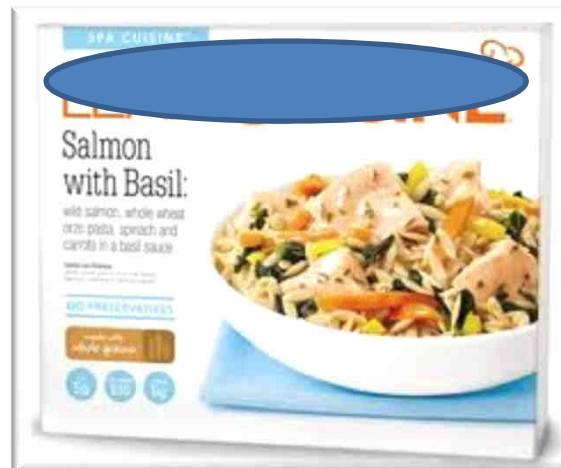
### Breaded seafood



### Seafood Entrée



### Unbreaded seafood





## Breaded seafood products offered by retailers, 09-10

Product	Items	Brands	Forms	Types	Sizes
Calamari	12	8	NA	5	7
Catfish	34	18	7	8	10
Clams	25	14	NA	8	8
Cod	51	22	8	17	18
Crab	13	10	NA	5	8
Crawfish	4	4	NA	4	4
Flounder	27	16	3	13	13
Haddock	42	17	5	15	14
Pangassius	0	0	0	0	0
Perch	10	9	2	6	4
Pollock	10	6	5	9	5
Salmon	3	3	2	3	1
Shrimp	315	56	14	28	9
<b>Tilapia</b>	<b>30</b>	<b>22</b>	<b>5</b>	<b>13</b>	<b>10</b>
Whiting	8	6	1	2	6

## Entrée seafood products offered by retailers, 09-10

Product	Items	Brands	Forms	Types	Sizes
Calamari	17	11	5	12	7
Catfish	11	5	3	9	8
Clams	45	18	3	16	12
Cod	41	28	10	30	14
Crab	169	62	20	39	49
Crawfish	37	24	5	13	20
Flounder	24	16	4	14	9
Haddock	14	6	4	9	13
Pangassius	1	1	1	1	1
Perch	3	3	2	3	3
Pollock	11	8	4	8	8
Salmon	224	79	16	177	40
Shrimp	378	85	27	272	50
<b>Tilapia</b>	<b>141</b>	<b>46</b>	<b>10</b>	<b>117</b>	<b>21</b>
Whiting	2	2	2	2	2
<b>Trout</b>	<b>6</b>	<b>1</b>	<b>1</b>	<b>5</b>	<b>2</b>

## Unbreaded seafood products offered by retailers in 2009-10

Product	Items	Brands	Forms	Types	Sizes
Calamari	180	69	16	16	12
<b>Catfish</b>	<b>143</b>	<b>58</b>	<b>7</b>	<b>6</b>	<b>17</b>
Clams	50	27	4	25	10
Cod	114	66	9	26	17
Crab	384	124	21	60	32
Crawfish	81	55	6	5	9
Flounder	81	45	5	8	12
Haddock	45	27	5	6	9
Pangassius	31	16	3	4	7
Perch	39	50	4	8	12
Pollock	104	63	10	19	16
<b>Salmon</b>	<b>308</b>	<b>124</b>	<b>17</b>	<b>65</b>	<b>32</b>
Shrimp	3834	280	NA	603	37
<b>Tilapia</b>	<b>214</b>	<b>100</b>	<b>5</b>	<b>7</b>	<b>17</b>
Whiting	110	58	3	11	11
<b>Trout</b>	<b>19</b>	<b>13</b>	<b>3</b>	<b>8</b>	<b>9</b>

# Results of demand analysis based on store-level scanner data (2005- 2010)

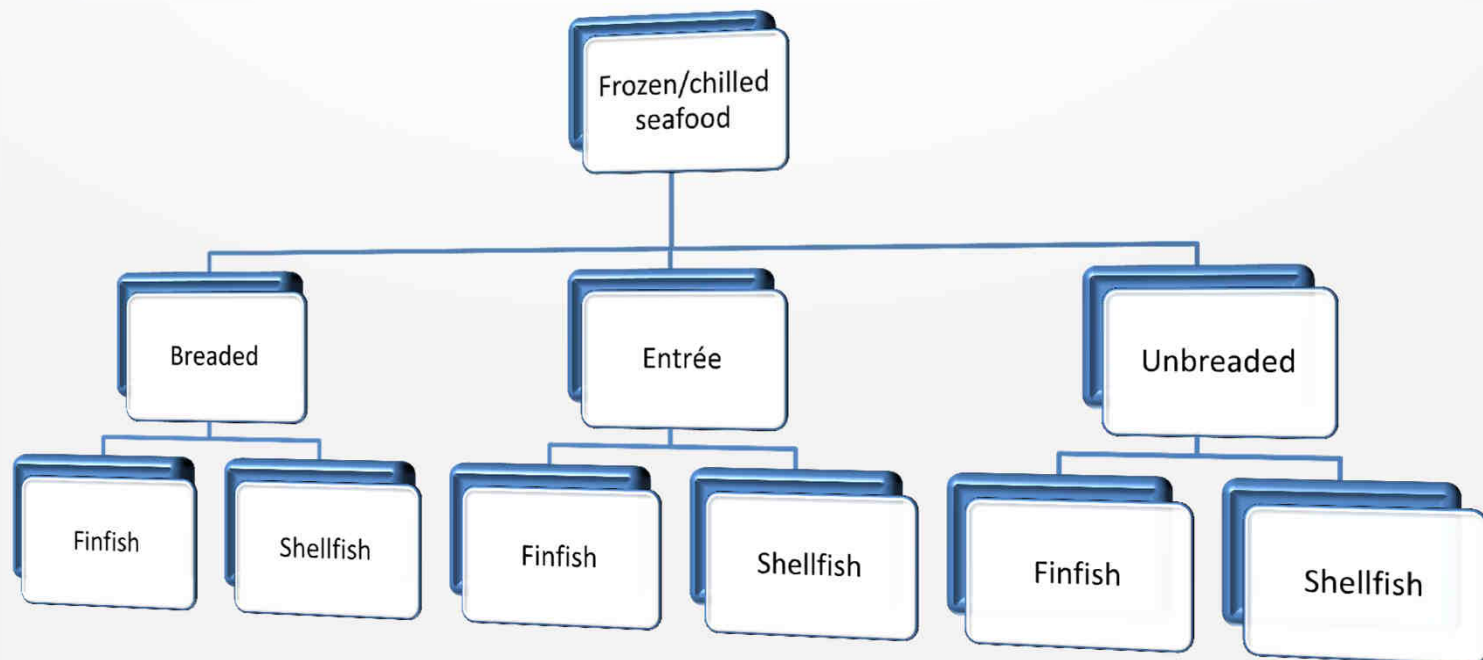


# How fish/seafood prices and market demand are responding to various factors?

## Methods

- State-of-the-art demand modeling approach
- Regional and seasonal analysis
- Price response models
- Studied many pairs of products; few cases are presented here.

# Demand analysis framework: Three different levels of aggregation



# Elasticities

Uncompensated elasticities			
Price of	Dependent variable		
	Breaded products	Entrée products	Unbreaded products
Breaded products	-1.051	0.456	-0.072
Entrée products	0.222	-0.932	-0.093
Unbreaded products	0.186	0.189	-1.104
<b>Expenditure Elasticity</b>	<b>0.643</b>	<b>0.415</b>	<b>1.244</b>

Compensated price elasticities			
Price of	Dependent variable		
	Breaded products	Entrée products	Unbreaded products
Breaded products	-1.07	0.439	-0.036
Entrée products	0.212	-0.941	-0.074
Unbreaded products	0.133	0.142	-1.004

# Finfish and Shellfish disaggregates- Summary

Equation*	Equation R <sup>2</sup>	Equation p-value	Average Price (\$/lb)	Average Budget share (%)
Breaded Finfish	0.89	<0.001	3.77	17.70
Breaded Shellfish	0.89	<0.001	6.18	5.40
Entrée Finfish	0.83	<0.001	5.63	5.98
Entrée Shellfish	-	-	4.94	6.51
Unbreaded Finfish	0.85	<0.001	4.22	17.11
Unbreaded Shellfish	0.88	<0.001	6.22	47.30



# Elasticities

Price of	Elasticity Matrix					
	Dependent variables					
	BFF	BSF	EFF	ESF	UFF	USF
Breaded Finfish	<b>-1.216</b>	<b>0.621</b>	<b>0.307</b>	<b>0.289</b>	<b>0.008</b>	<b>0.022</b>
Breaded Shellfish	<b>0.150</b>	<b>-1.882</b>	<b>0.098</b>	<b>0.114</b>	<b>-0.002</b>	<b>0.117</b>
Entrée Finfish	<b>0.070</b>	<b>0.112</b>	<b>-1.002</b>	<b>-0.017</b>	<b>0.001</b>	<b>0.024</b>
Entrée Shellfish	<b>0.074</b>	<b>0.110</b>	<b>-0.036</b>	<b>-0.898</b>	<b>-0.081</b>	<b>0.033</b>
Unbreaded Finfish	<b>0.005</b>	<b>0.045</b>	<b>0.071</b>	<b>-0.109</b>	<b>-1.030</b>	<b>0.132</b>
Unbreaded Shellfish	<b>0.031</b>	<b>0.180</b>	<b>-0.030</b>	<b>0.186</b>	<b>0.141</b>	<b>-1.153</b>
Expenditure Elasticity	<b>0.634</b>	<b>0.766</b>	<b>0.461</b>	<b>0.413</b>	<b>0.904</b>	<b>1.347</b>

**Uncompensated own-price elasticities and Compensated Cross-elasticities**

## Demand Analysis: Disaggregated level

# Geographical clustering of the markets

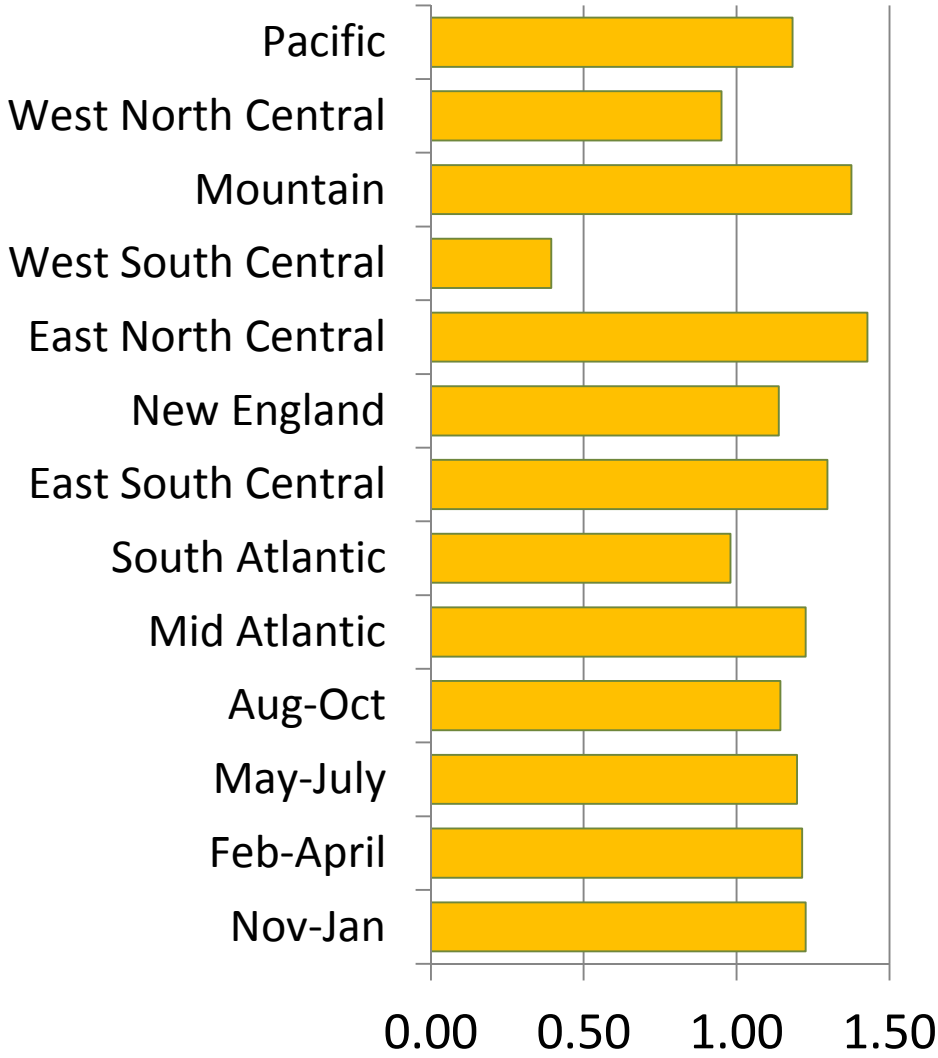
MIDWEST		SOUTH			NORTHEAST		WEST	
East North Central	West North Central	East South Central	South Atlantic	West South Central	Mid Atlantic	New England	Mountain	Pacific
Chicago	Des Moines	Birmingham	Atlanta	Dallas	Albany	Boston	Denver	Los Angeles
Cincinnati	Kansas City	Louisville	Baltimore	Houston	Buffalo/Rochester	Hartford/New Haven	Las Vegas	Portland
Cleveland	Minneapolis	Memphis	Charlotte	Little Rock	New York		Phoenix	Sacramento
Columbus	Omaha	Nashville	Jacksonville	New Orleans/Mobile	Philadelphia		Salt Lake City/Boise	San Diego
Detroit	St. Louis		Miami	Oklahoma City/Tulsa	Pittsburgh			San Francisco
Grand Rapids			Orlando	San Antonio	Syracuse			Seattle
Indianapolis			Raleigh	West Texas				
Milwaukee			Richmond/Norfolk					
			Tampa					
			Washington DC					

# Catfish

Own-price elasticity



Expenditure elasticity

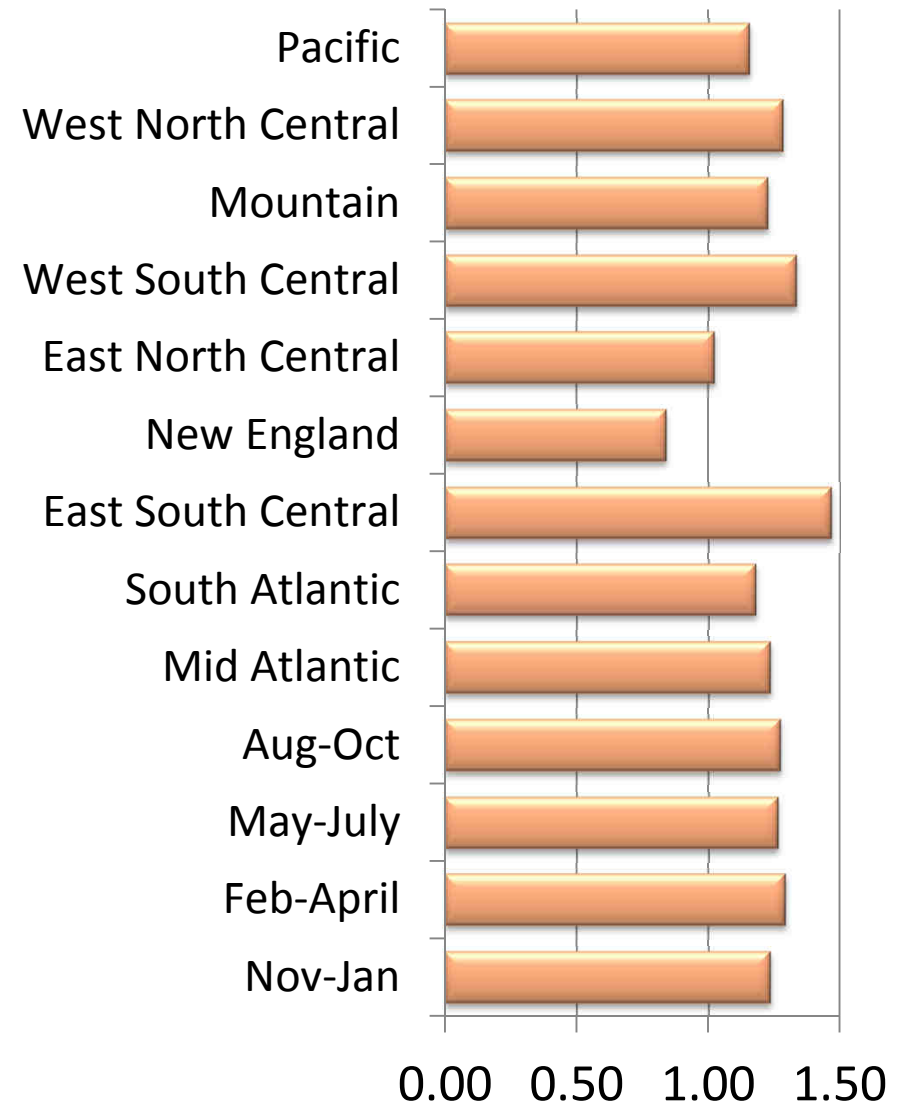


# Tilapia

## Own-price elasticity



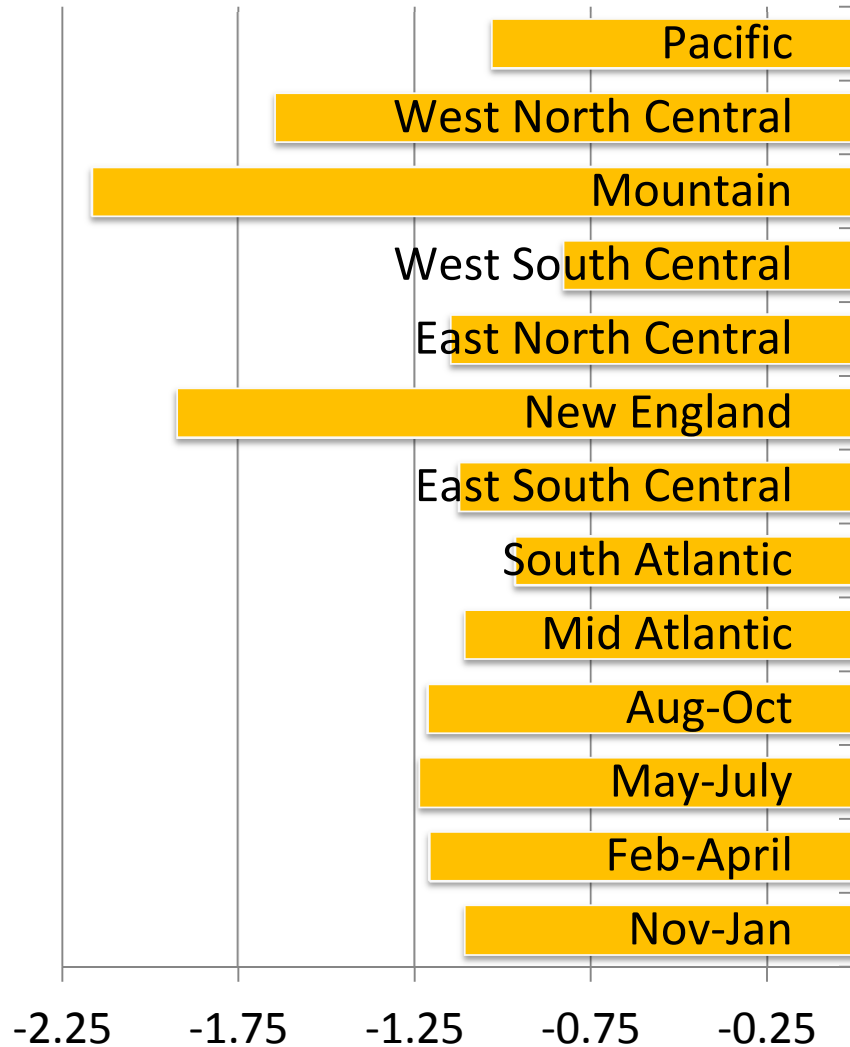
## Expenditure elasticity



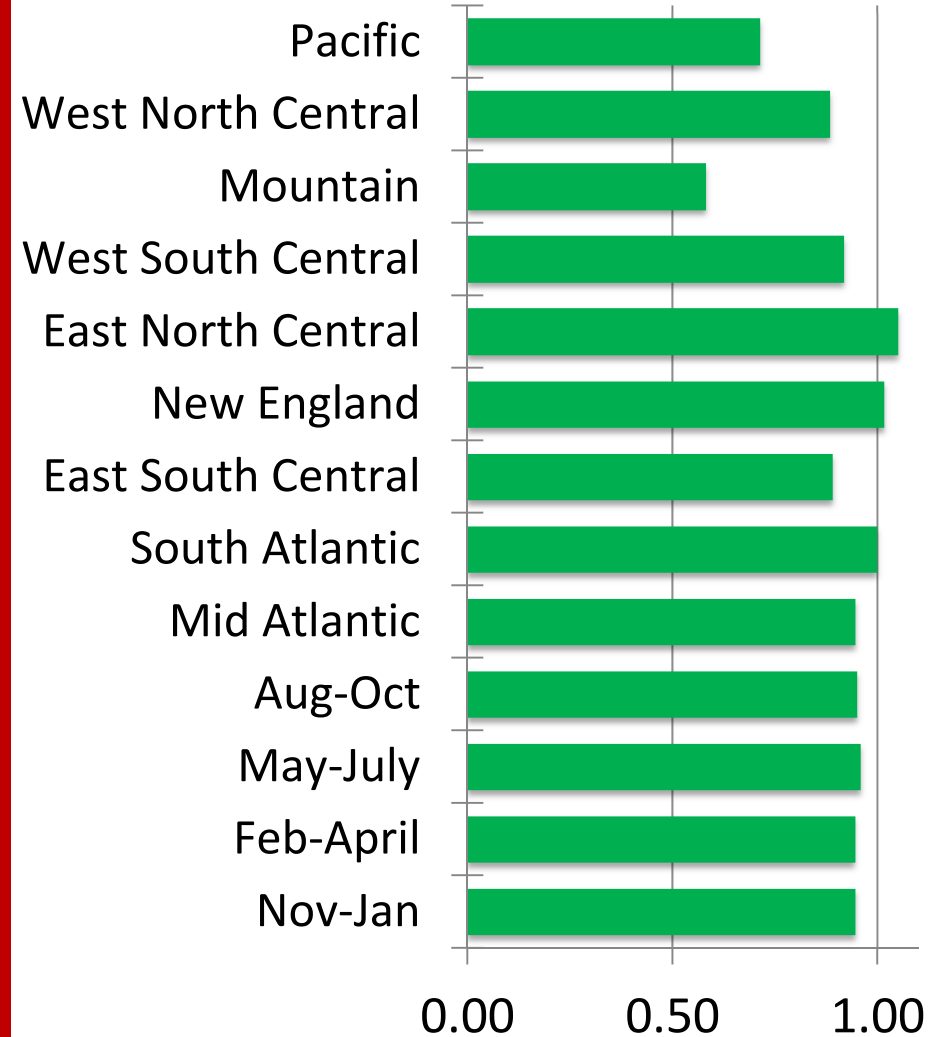


# Salmon

## Own-price elasticity

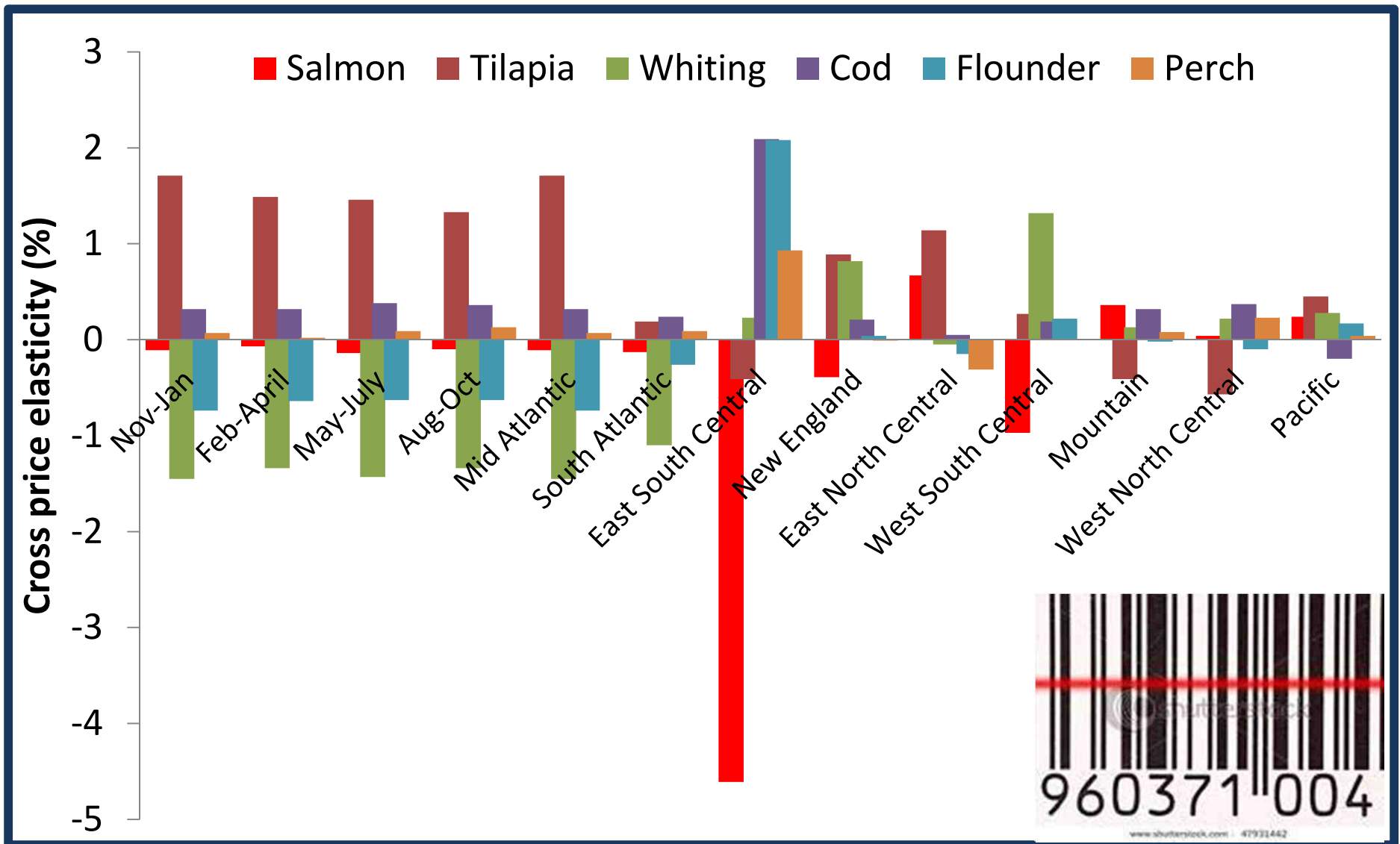


## Expenditure elasticity



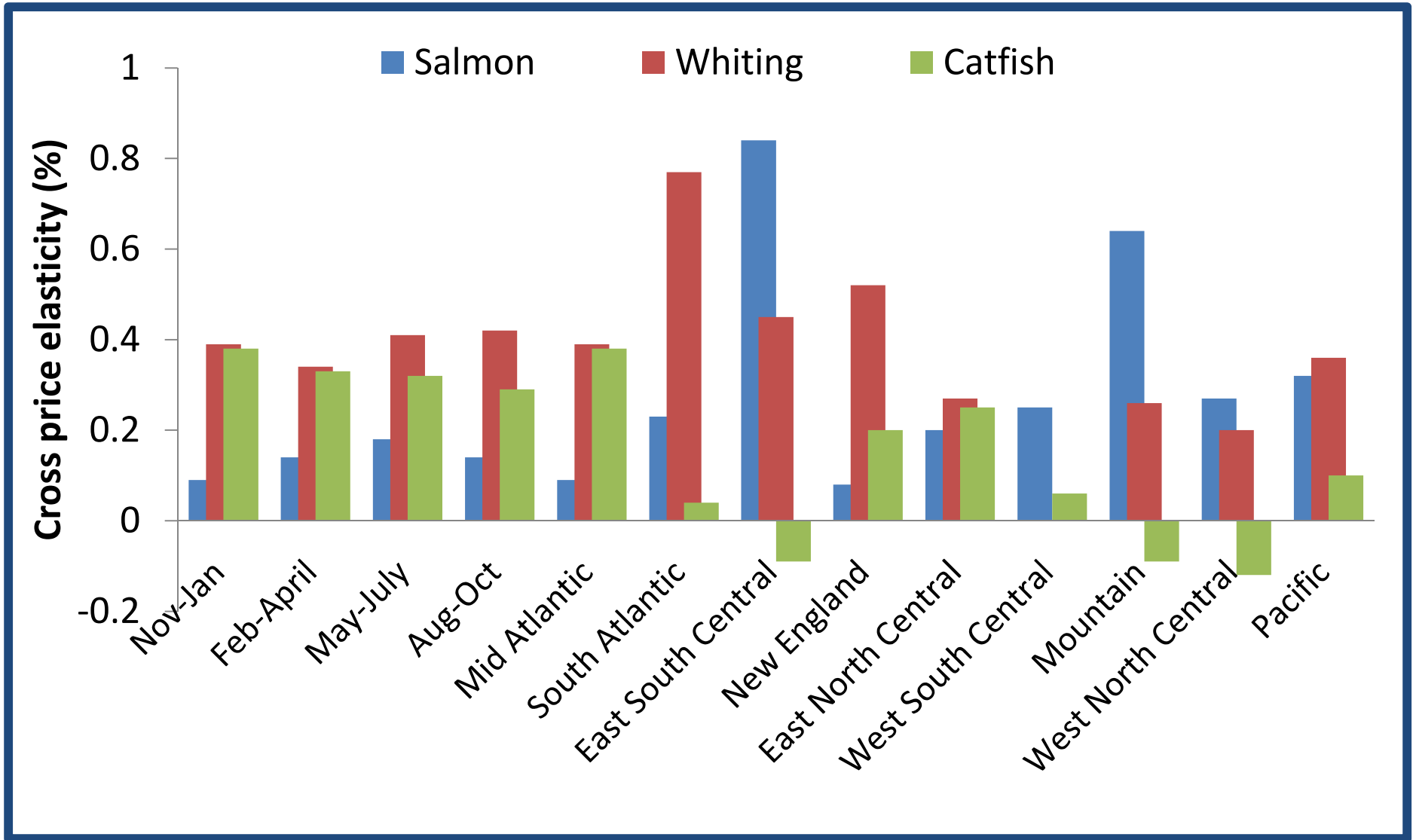
# Cross-price Elasticities of Catfish (Substituting Catfish for others)

(substitute = Positive value)

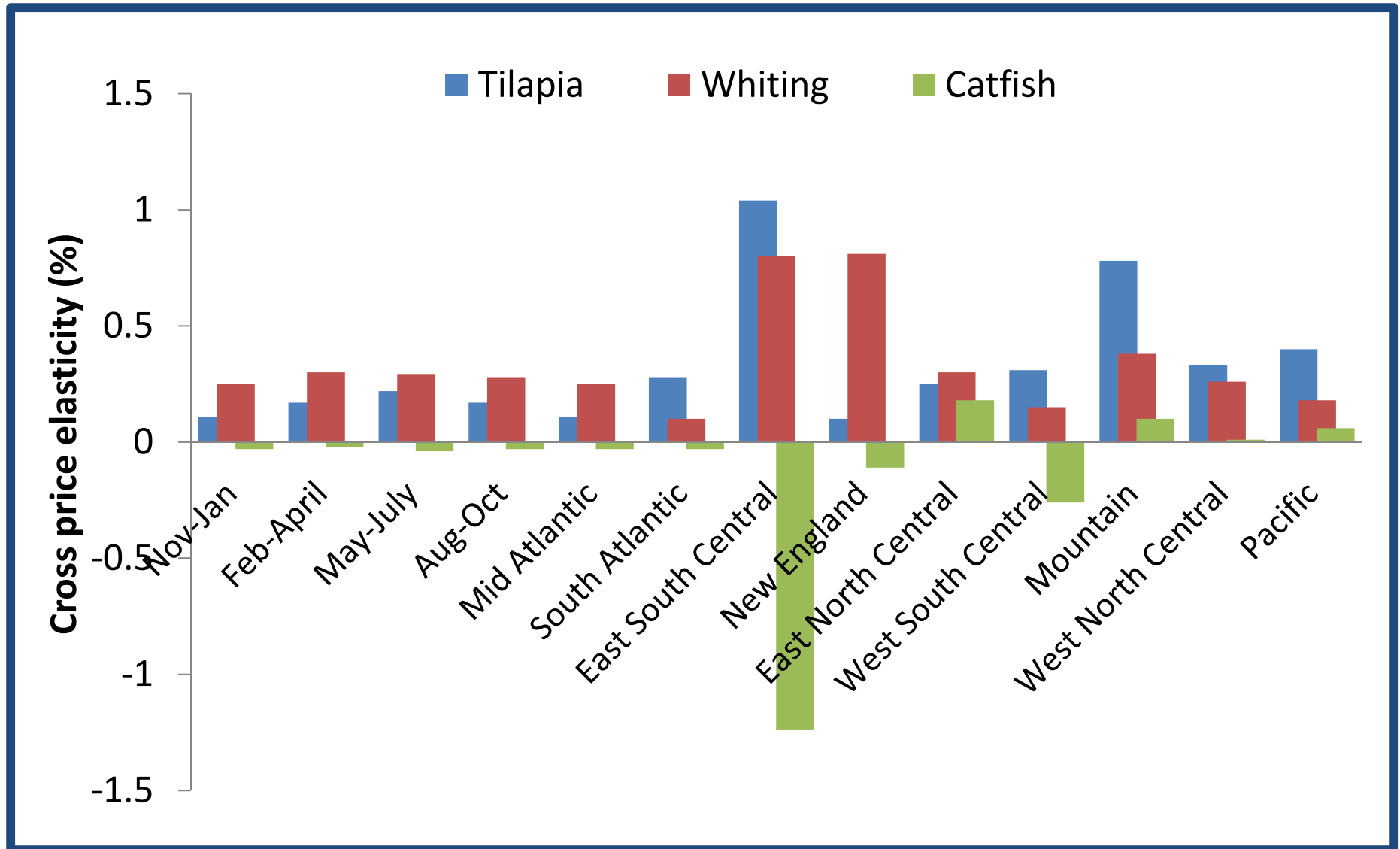


# Cross-price Elasticities of Tilapia (Substituting Tilapia for others)

(substitute = Positive value)



## Cross-price Elasticities of Salmon (Substituting Salmon for others) (substitute = Positive value)

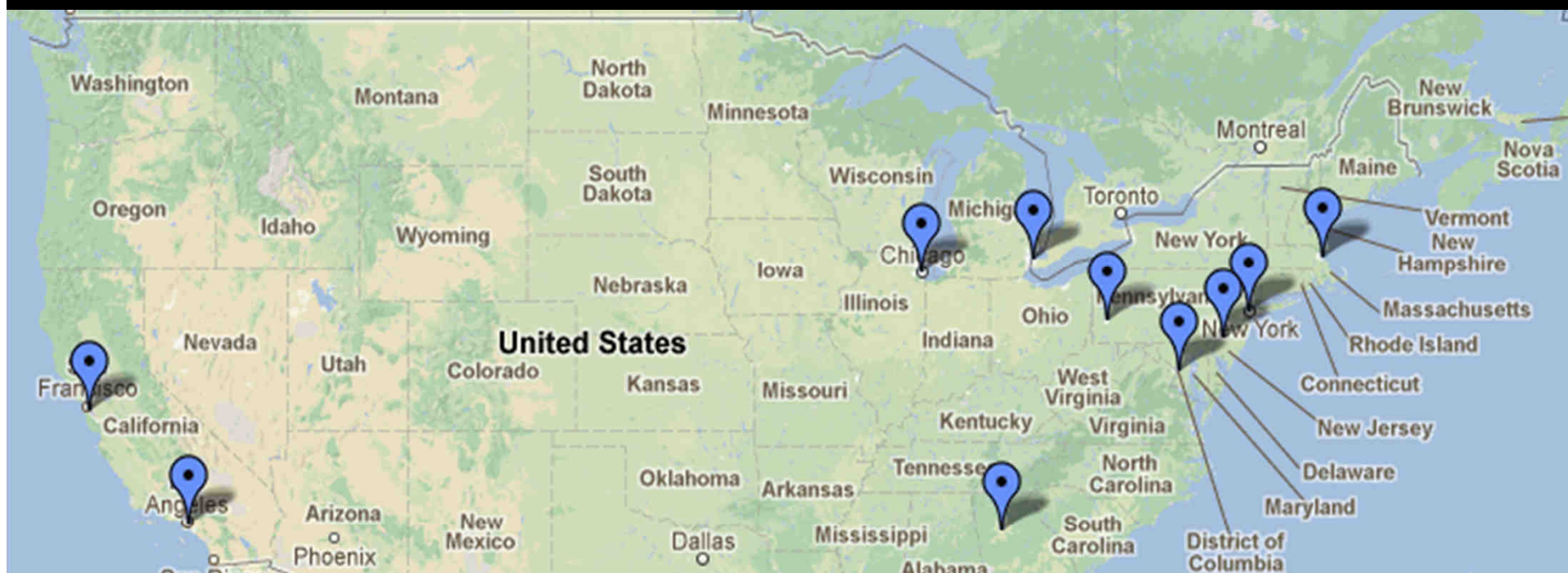


# Dataset: With Walmart Stores 2009-2013



# Markets covered

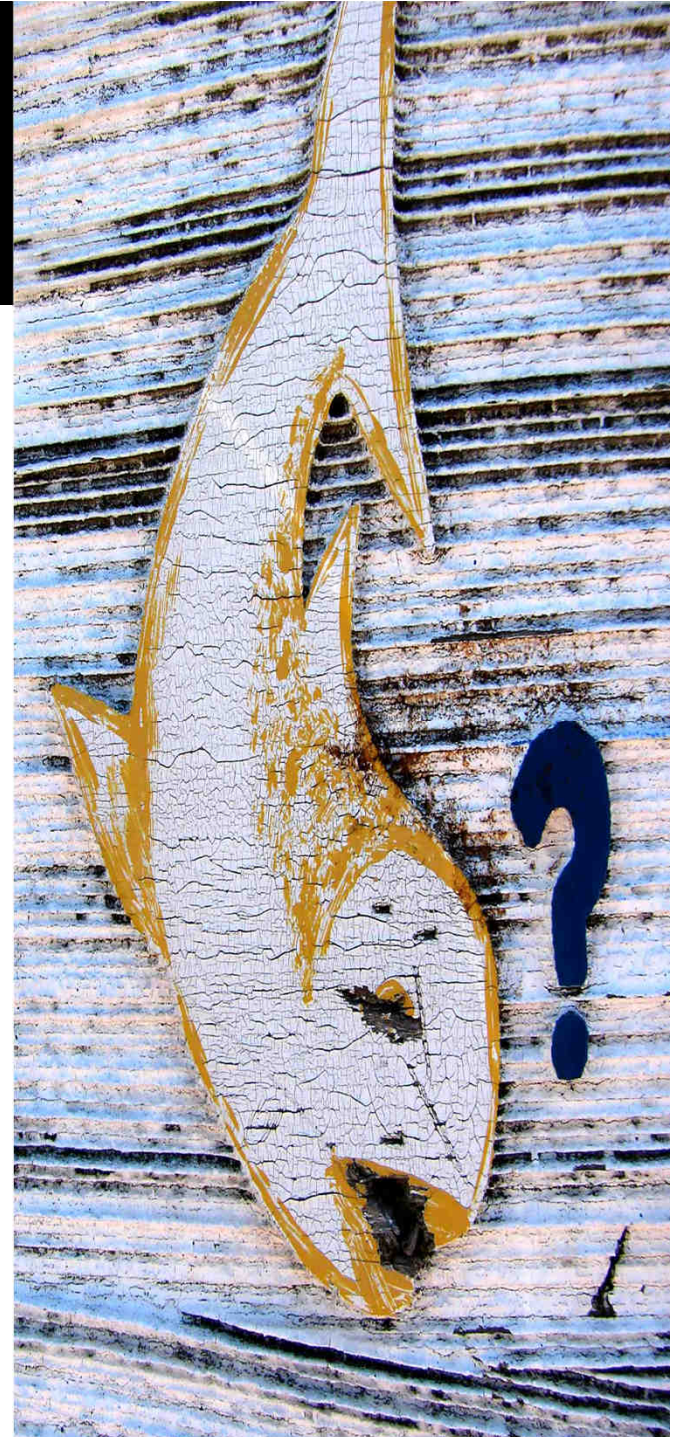
Atlanta, Boston, Chicago, Detroit, Los Angeles,  
New York, Philadelphia, Pittsburgh,  
San Francisco & Washington D.C



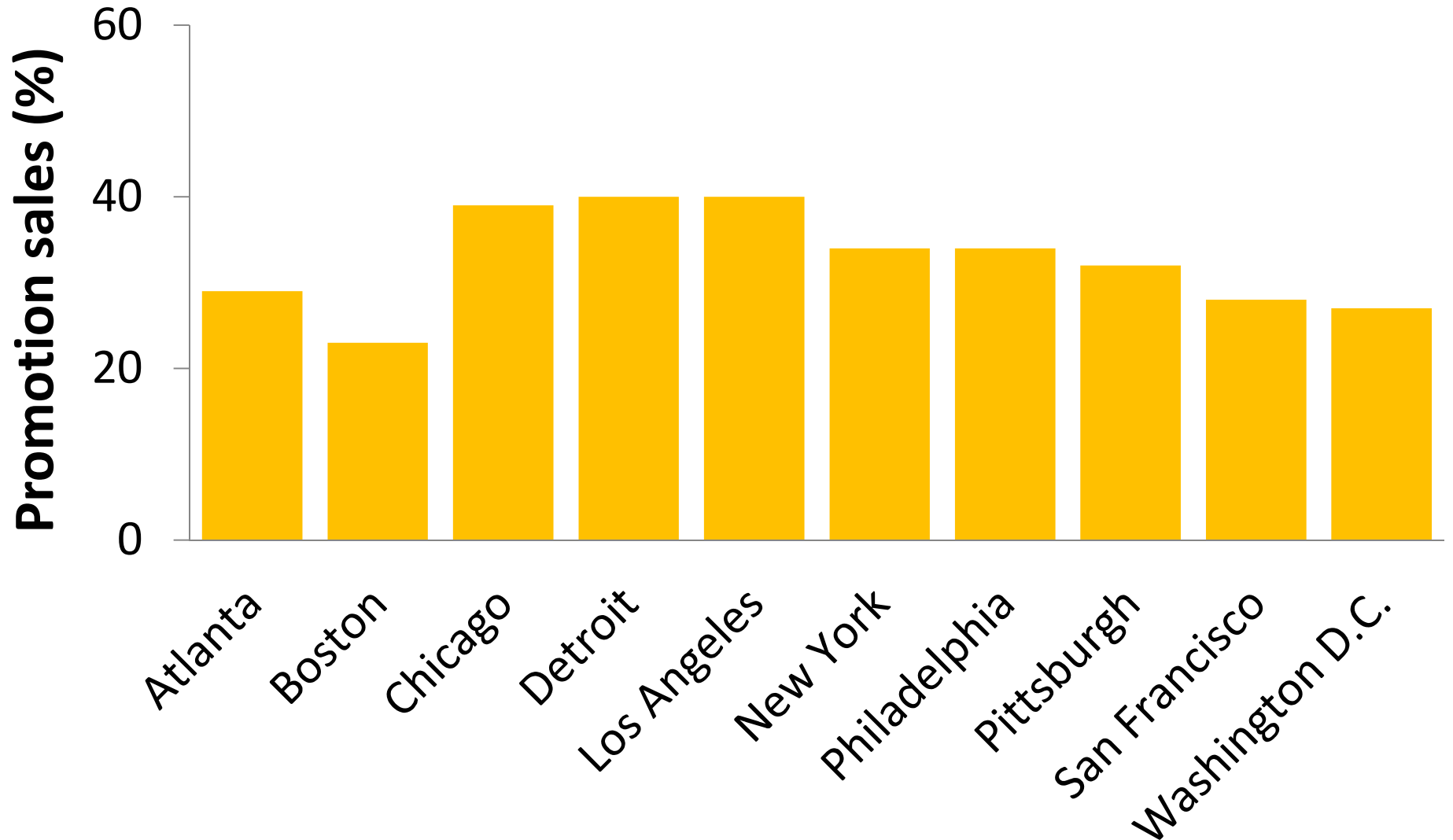
Time period covered  
2009 to 2013

# \$ of product attributes: Hedonic pricing approach

$$\begin{aligned}\ln(p_{it})^{**} = & \beta_0 + \beta_1 \text{Brand}_{it} + \\ & \beta_2 \text{SpeciesForm}_{it} + \\ & \beta_3 \text{ProcessForm}_{it} + \beta_4 \text{PackageSize}_{it} + \\ & \beta_5 \text{OtherProcess}_{it} + \\ & \beta_6 \text{Origin}_{it} + \\ & \beta_7 \text{Wild}_{it} + \\ & \beta_8 \text{Time}_{it} + \varepsilon_i\end{aligned}$$



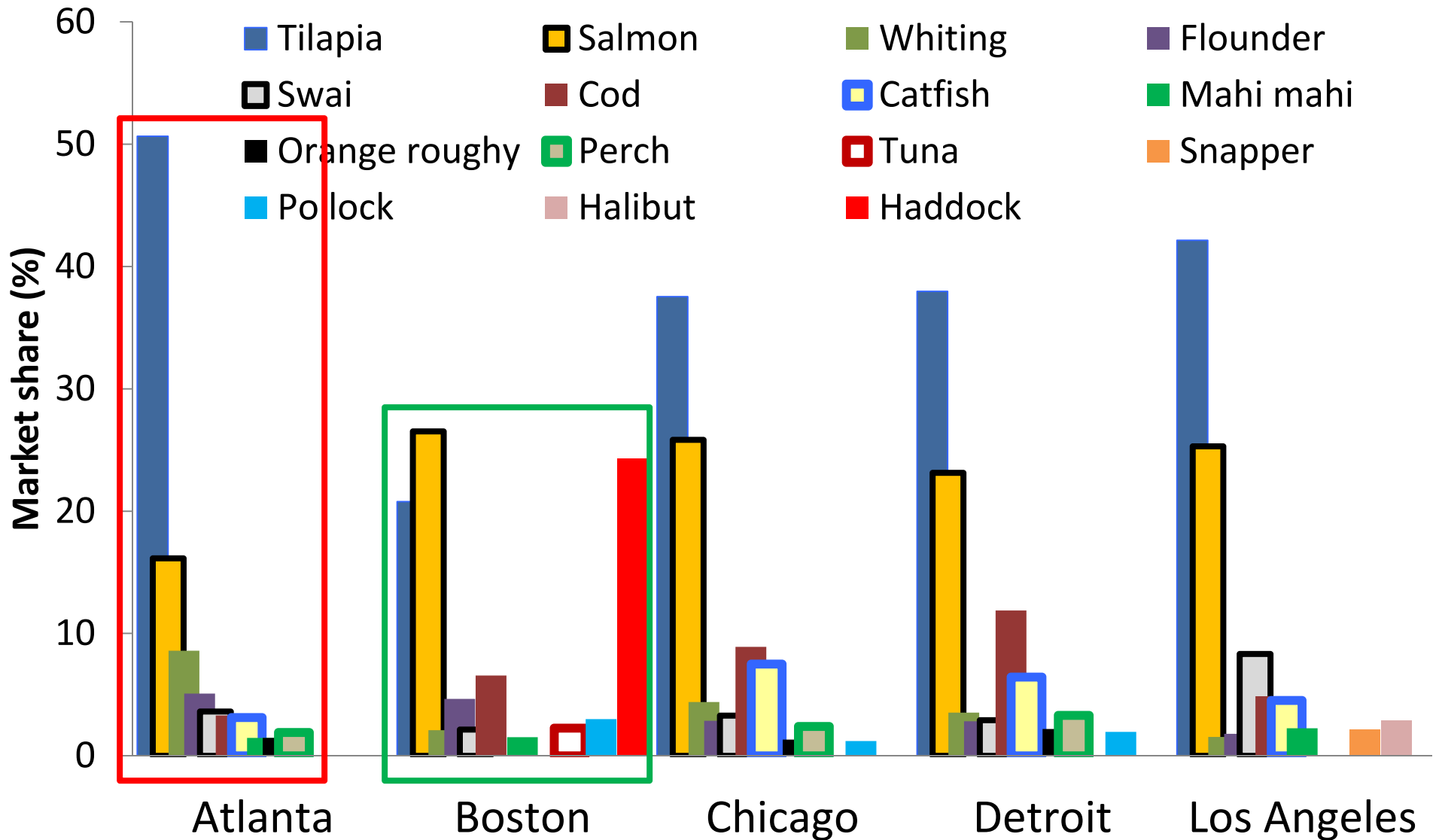
**\*\*Current price: weighted price  
(regular + promotion)**

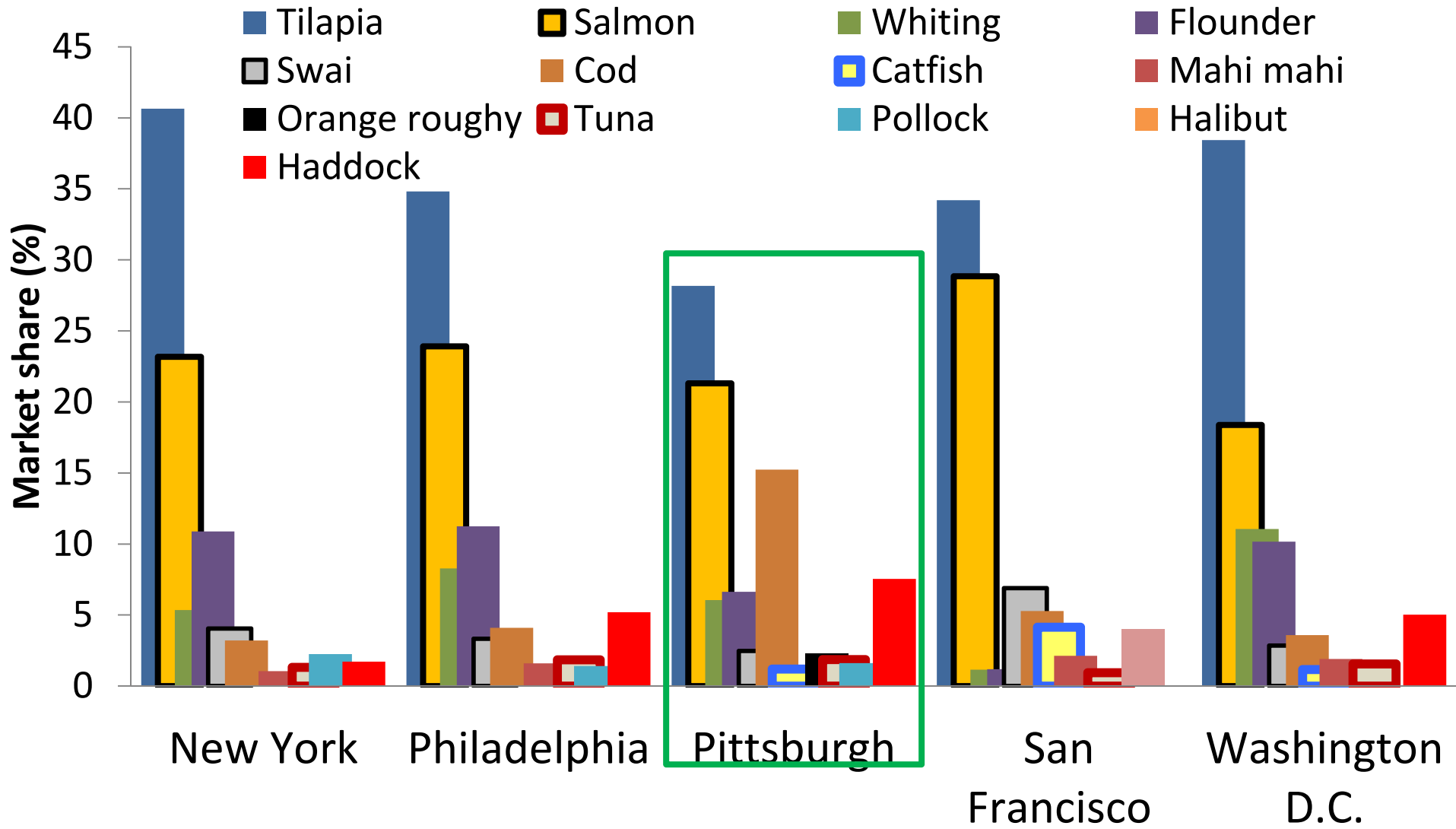
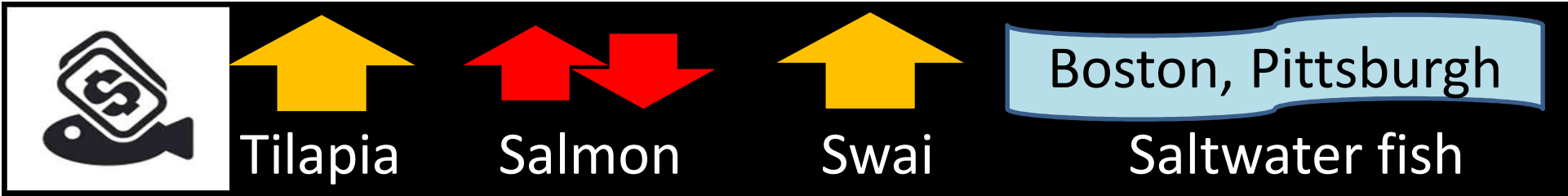




Top 10 species = 90% market share

Tilapia + salmon = 60% market share



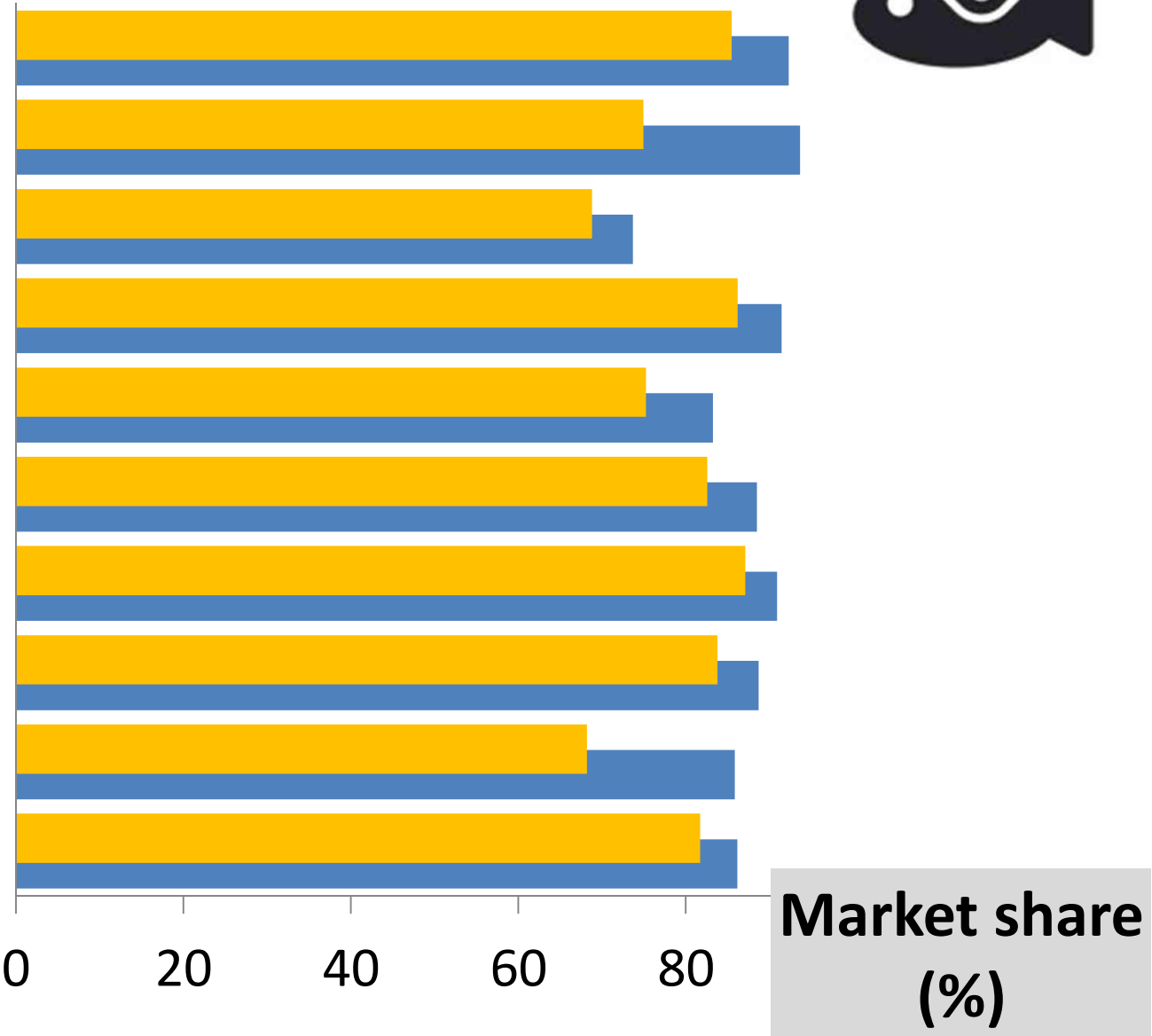




 Fillet: average 80%



- Washington D.C.
- San Francisco
- Pittsburgh
- Philadelphia
- New York
- Los Angeles
- Detroit
- Chicago
- Boston
- Atlanta

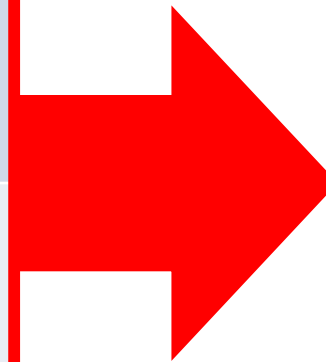


 Fillet  
 Top-10

**Market share (%)**

# Impact on price: species & fillet

\$/lb	Species
>1	Whiting
1-2	Tilapia, swai, flounder
2-4	Catfish, cod, haddock
3-5	salmon



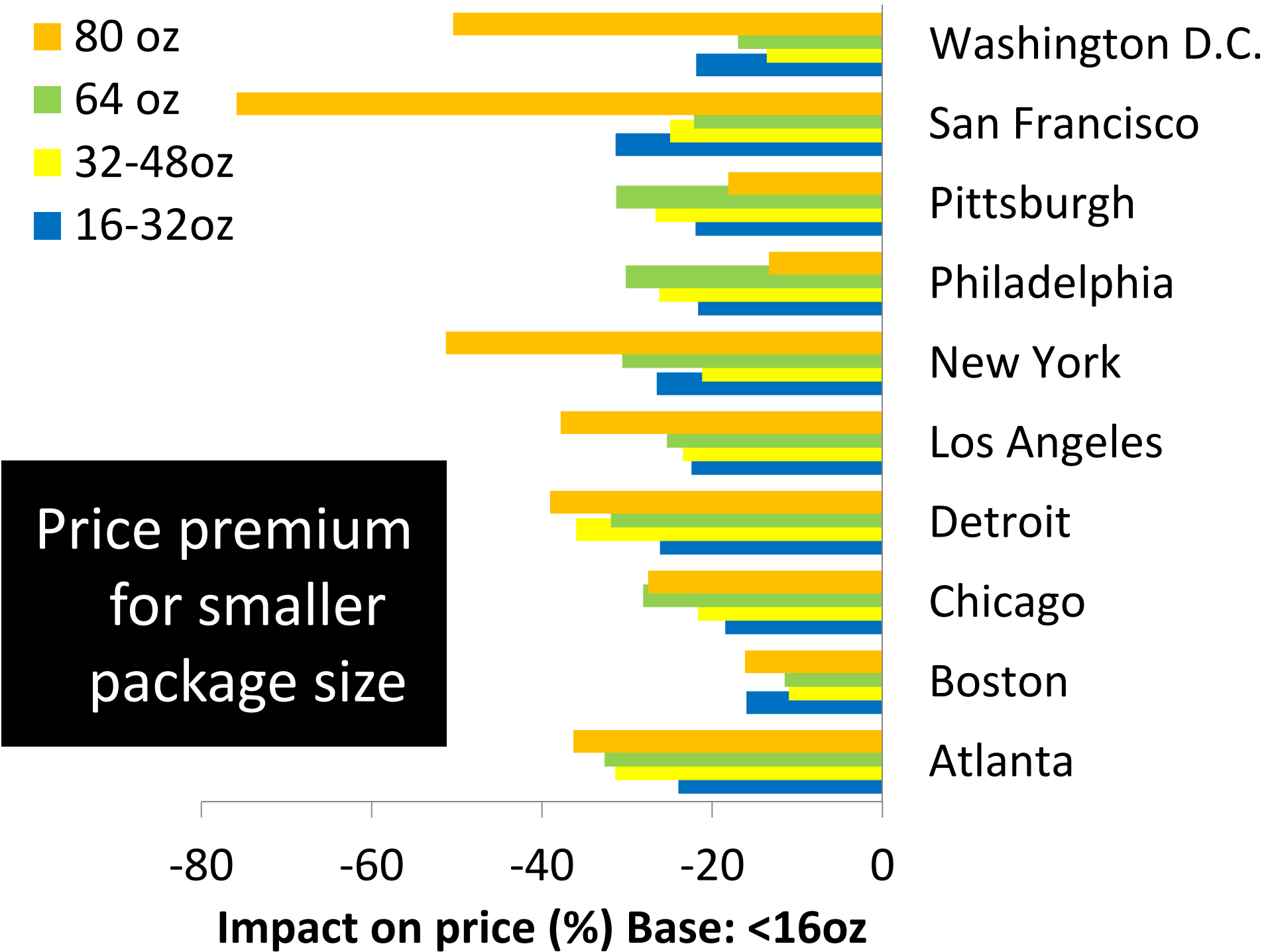
**65%**

Fillet as base  
consumers paid premium for:

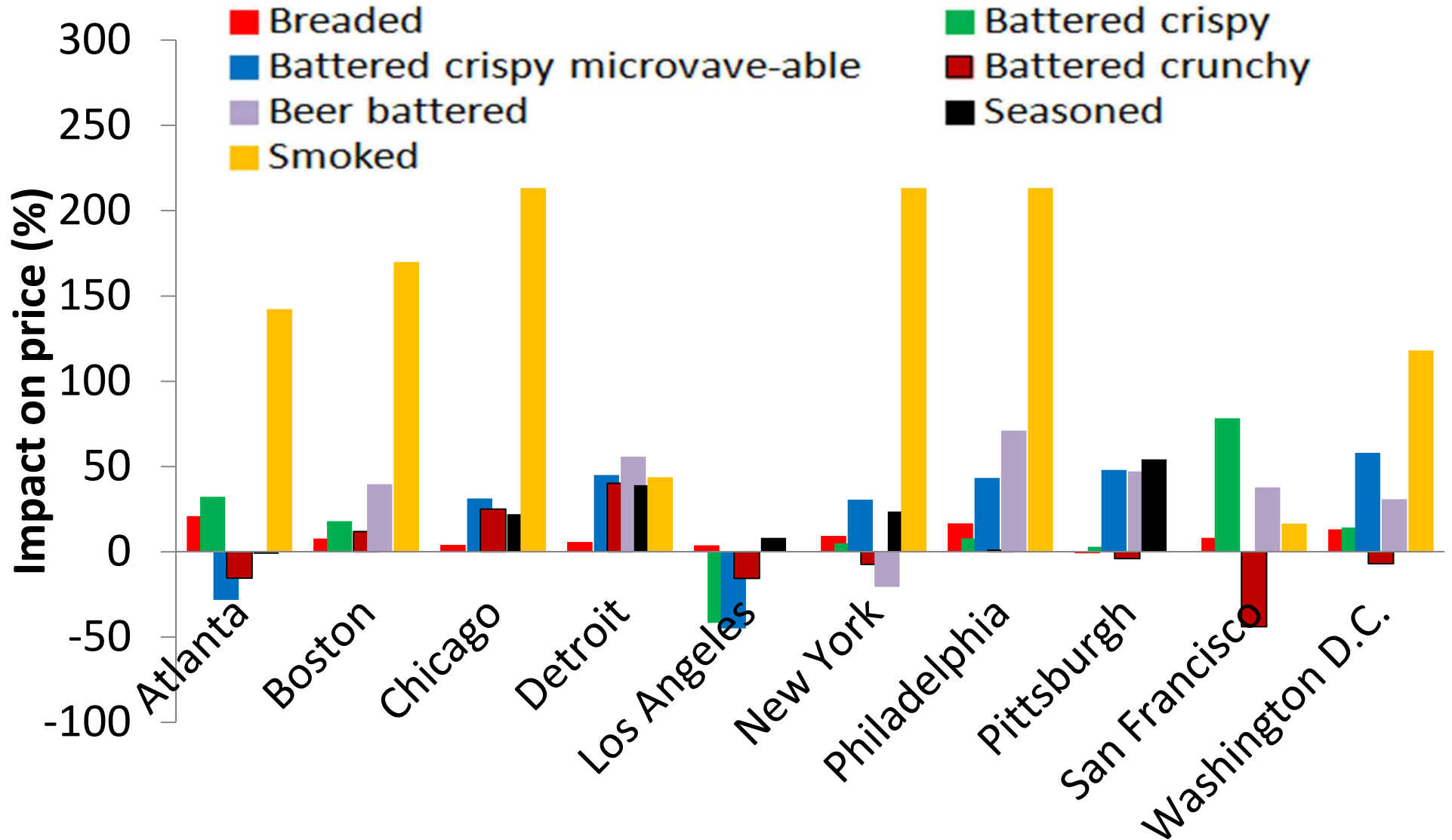
Form	Species
bit/piece	<u>Salmon</u> , cod, flounder, haddock
cut/steak	Halibut, tilapia
fillet loin	Cod
Fillet portion	<u>Salmon</u> , perch
Fillet whole	Flounder, orange roughly, <u>salmon</u>
loin	Cod, flounder, mahi mahi
nugget	<u>Salmon</u>
portion	Pollock, <u>salmon</u> , orange roughly
slice	<u>Salmon</u> , cod
slider	Haddock, <u>salmon</u>
stick	Catfish

# Implicit price: package size

- ✓ 90% of the seafood products sold was below 48oz (12 servings).
- ✓ Price premium varies across markets:
  - Prefer smaller size (below 6oz):
    - Boston, Chicago, Philadelphia, Pittsburgh
  - Prefer larger “value-pack” size:
    - Atlanta, Detroit, Los Angeles



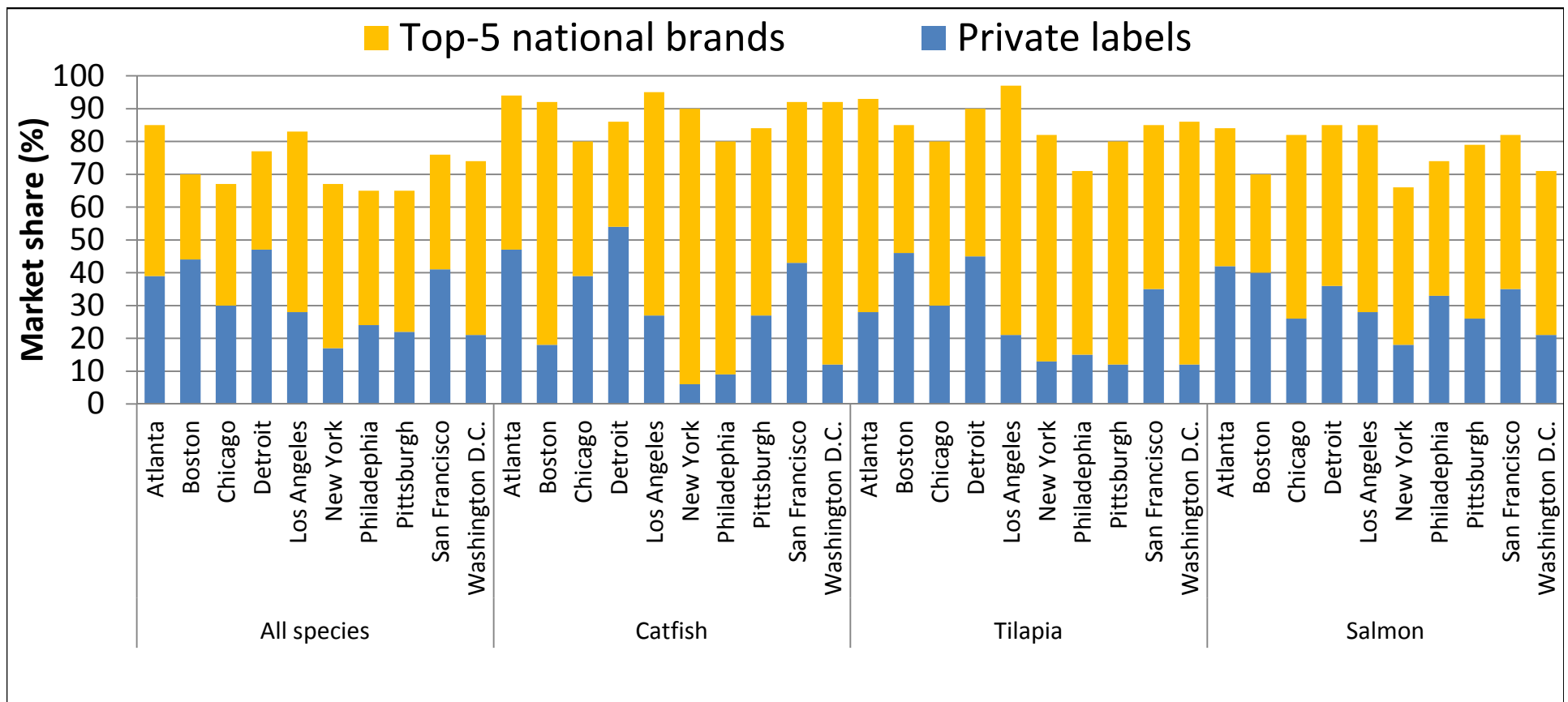
# Potential price premium attributes: convenience and smoked





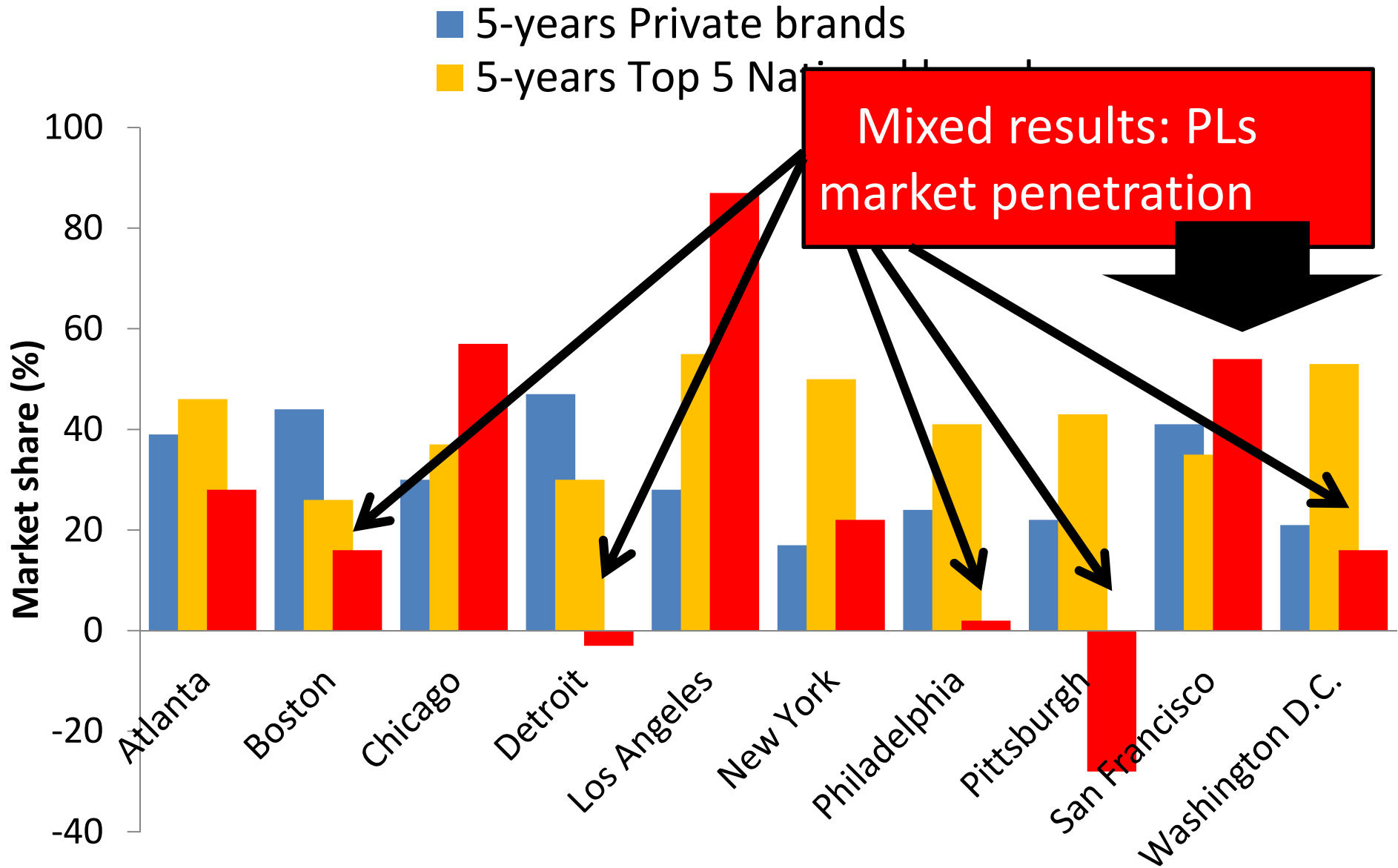
# Firm/brand: likely oligopolistic market structure

- Private labels (PLs) have continued to grow significantly in the seafood markets but it is likely to be market and species specific.

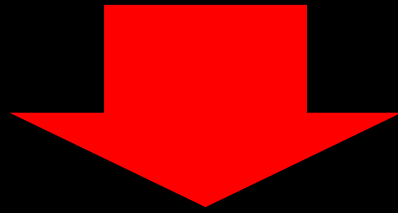




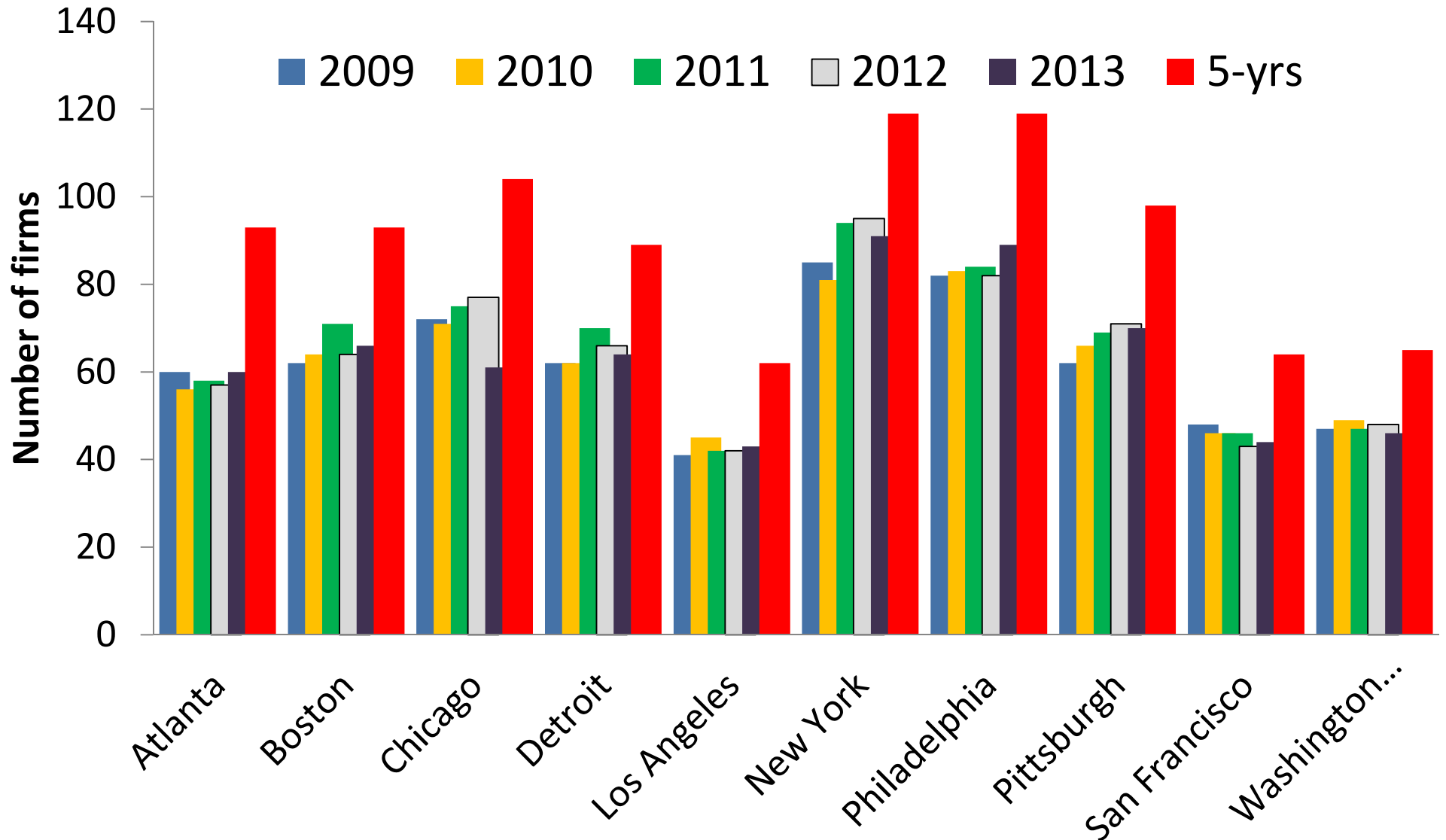
Private labels + Top 5 NBs = 65 to 85%

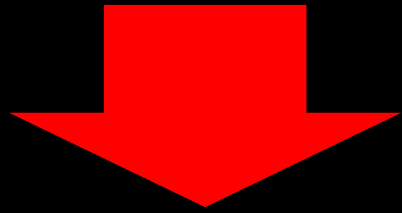


Walmart

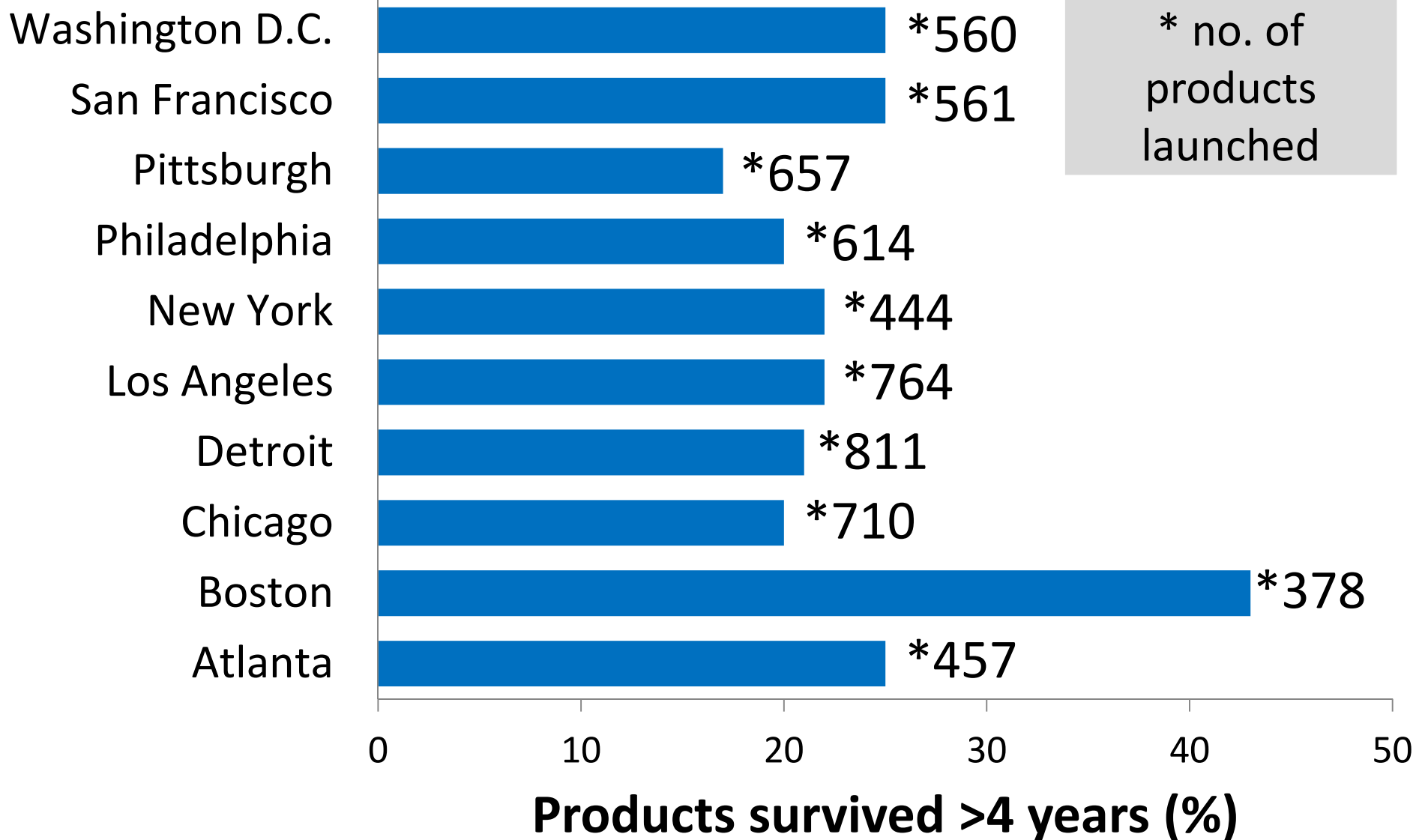


success rate of firms???





# success rate of products launched???



# Implicit price: brand

- ✓ Overall, consumers paid a price premium for private labeled fish products across 10 markets.
- ✓ Price premium for national brands, such as Gorton's, Mrs. Paul, Treasures of the Sea, C. Wirthly Co,. & Great American Seafood .

# Mixed-species vs species-specific brands

- Price of mixed-species saltwater

Walmart



than

- Of all the top 10 brands, consumers paid premium for:



C. Wirthly Co.