# Children and Household Purchases of Seafood and Meat in Norway

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# Data

- We have files with each purchase of a fish or meat product for the time period from 2000-2011. Data are stratified by region, urbanization, household size and age of main purchaser from GFK (census population) and each purchase is weighted so that the dataset represent 1500 households purchases on a monthly basis. (We have not used the weights in our estimations.)

- For each year we have a file with the traditional demographic information and a lot of other information, like main shop, cat-owner and food related statements for each of the households

- We have aggregated the data into monthly volumes/values/prices per household

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# Children and Household Purchases of Seafood and Meat in Norway

- Despite high consumption of fish and other seafood in Norway, many families with children and youngsters eat much less than what the health authorities advise
- In the dataset we have the «frozen salmon revolution». Has this product innovation changed the seafood consumption for households with children?
- We utilize several of the demographical variables in the dataset to make up a new variable we call «Lifecycle», which basically divides the households in “before children”, “after children” and in four groups by youngest child's age

# LA/AIDS (Almost Ideal Demand System) Model with Laspeyre's Price Index, IMRs, Demographic and Trend Variables

$$w_i = a_i + \sum_k \delta_{ik} D_k + \sum_m \sigma_{im} M_m + \sum_j \gamma_{ij} \ln(p_i) + \beta_i \left(\ln(x) - \sum_j \bar{w}_j \ln(p_j)\right) + \mu_i$$

- $w_i$: Budget share of $i$th good
- $\sum_k \delta_{ik} D_k$: Demographic/dummy variables included time trends and interaction between dummies and time trends
- $\sum_m \sigma_{im} M_m$: IMR of $i$th good
- $\sum_j \gamma_{ij} \ln(p_i)$: Price of $i$th good
- $\beta_i \left(\ln(x) - \sum_j \bar{w}_j \ln(p_j)\right)$: Total expenditure using Laspeyre's price index
- $\mu_i$: random disturbances

- Budget shares for seafood, red meat and poultry
- Time trends «Year» and «Year$^2$»

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# Model Restrictions

- n equations, estimating the shares $w_{x1}$, $w_{x2}$ and $w_{xn}$ for n products in a system where the total budget is given by the total value of the consumption of the n products we estimate on. Singularity of the model gives estimation results in the model for all equations except one
- But by using the adding up and homogeneity restrictions you can find the parameters for the last equation
- Model is constrained by the theoretical restrictions homogeneity and symmetry

- Adding up: $\sum_i a_i = 1,\ \sum_i \beta_i = 0,\ \sum_k \gamma_{kj} = 0$
- Homogeneity: $\sum_i \gamma_{jk} = 0$ Symmetry: $\gamma_{ij} = \gamma_{ji}$
- Demographic/dummy/trend variables: $\sum_i \delta_{ik} = 0$

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# IMR (and Probit Models)

- When using disaggregated data we get a challenge with zero observations
- To avoid the potential selection bias, due to the zero observations, invers  Mills ratios, as suggested by Heien & Wessels (1988) and improved by Shonkwhiler & Yen (1999) are used
- In contrast to earlier studies, we include IMRs in all equations, to keep the system invariant to which equation is deleted

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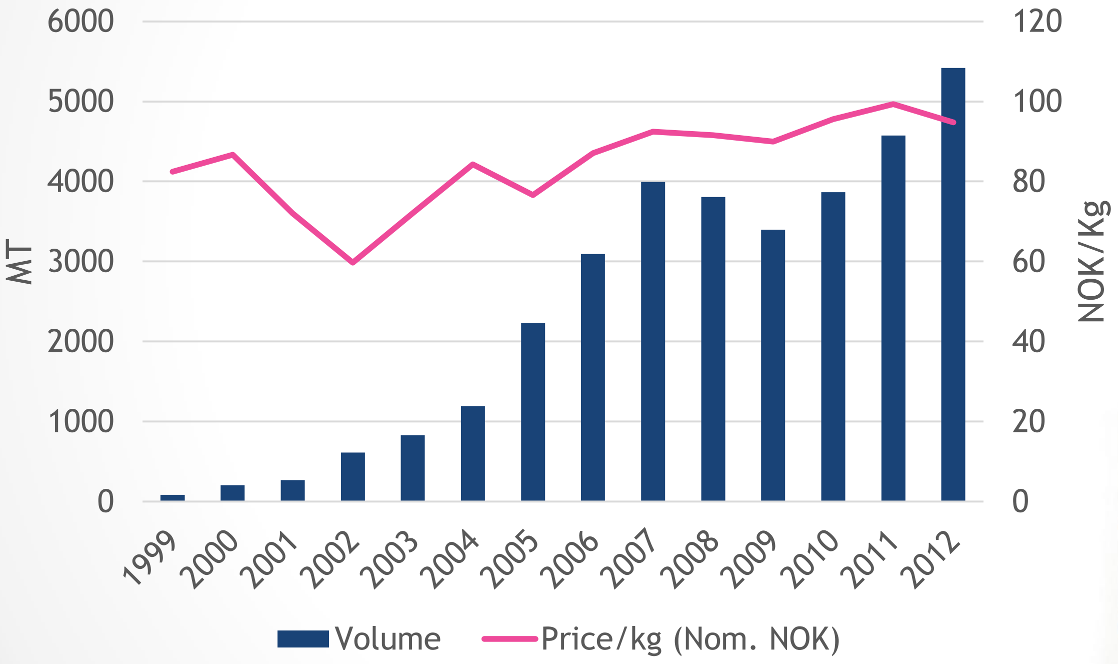
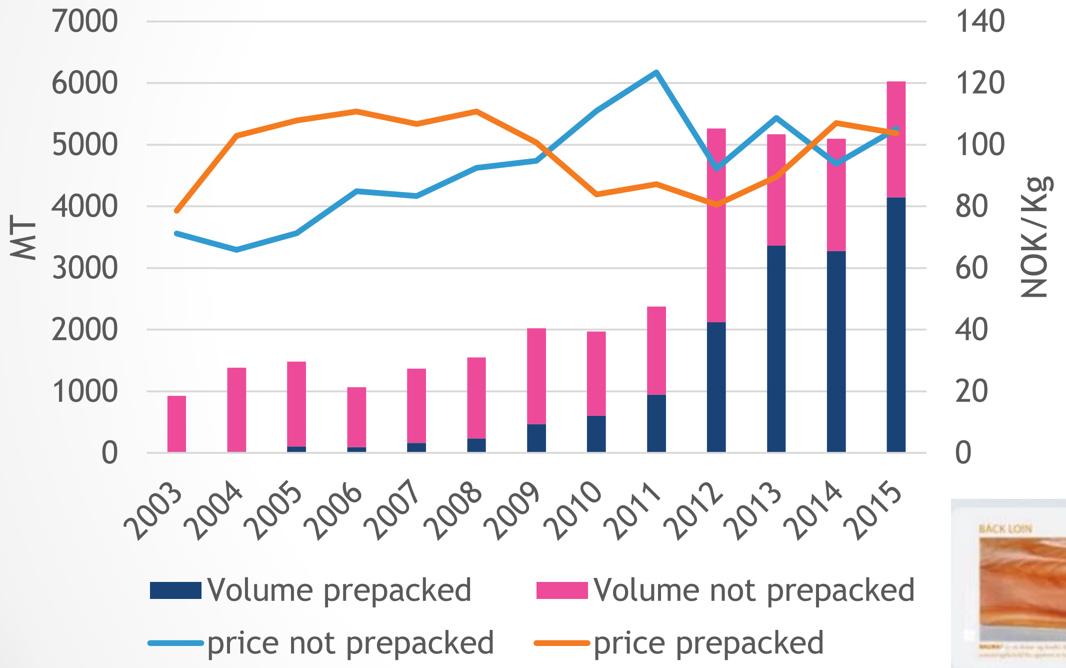
# Household Consumption of Frozen Salmon Fillets





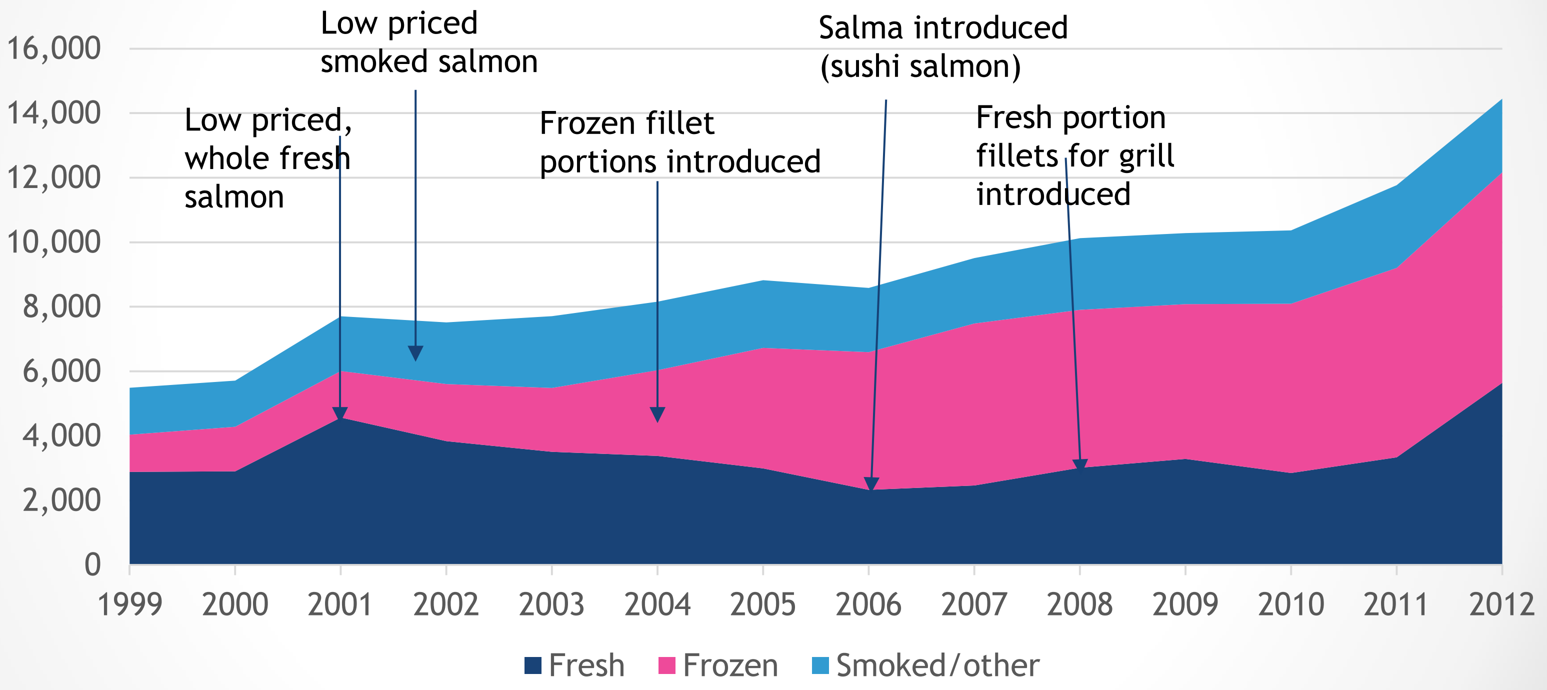
# Household Consumption of Fresh Salmon Fillets, MT






# Household Consumption of Salmon, MT

## (Product weight household consumption)

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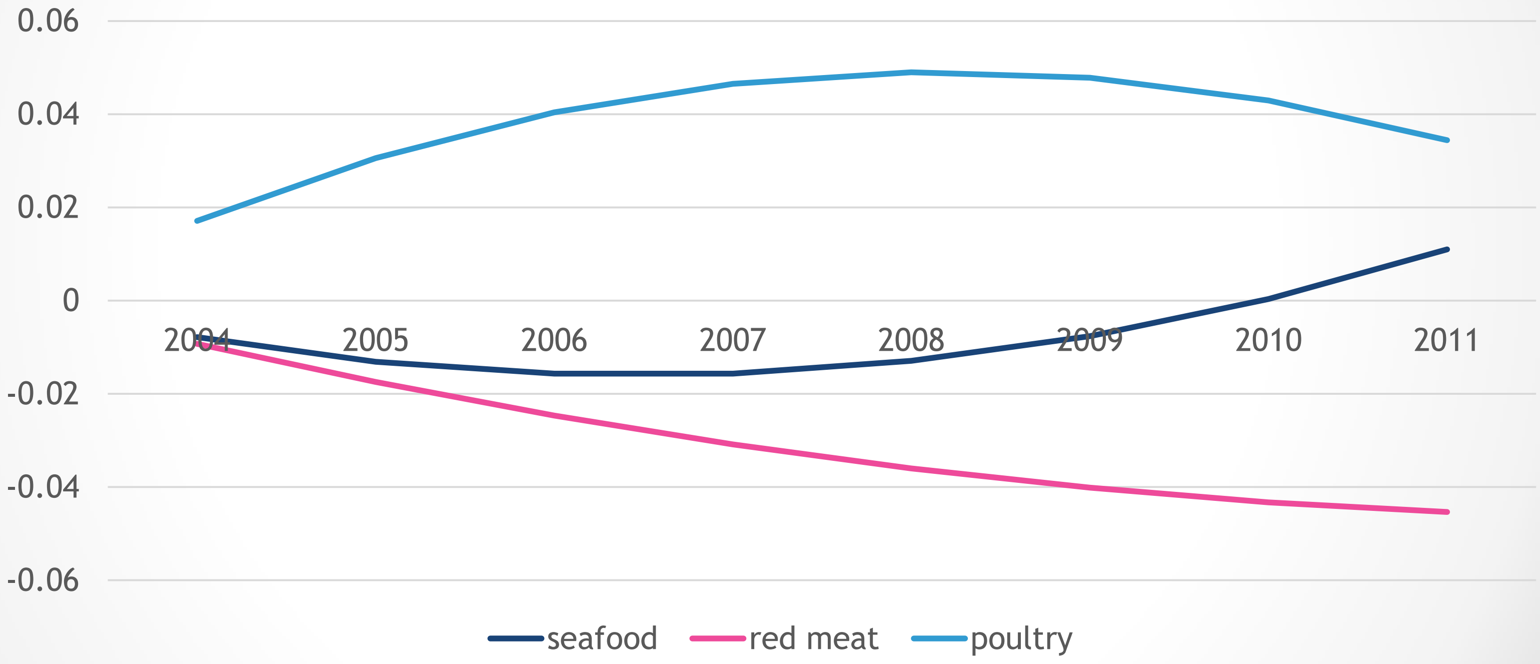
Source: GFK-Norge/Norwegian Seafood Council

# Some Preliminary Results

# Estimated Time Trends, t and $t^2$

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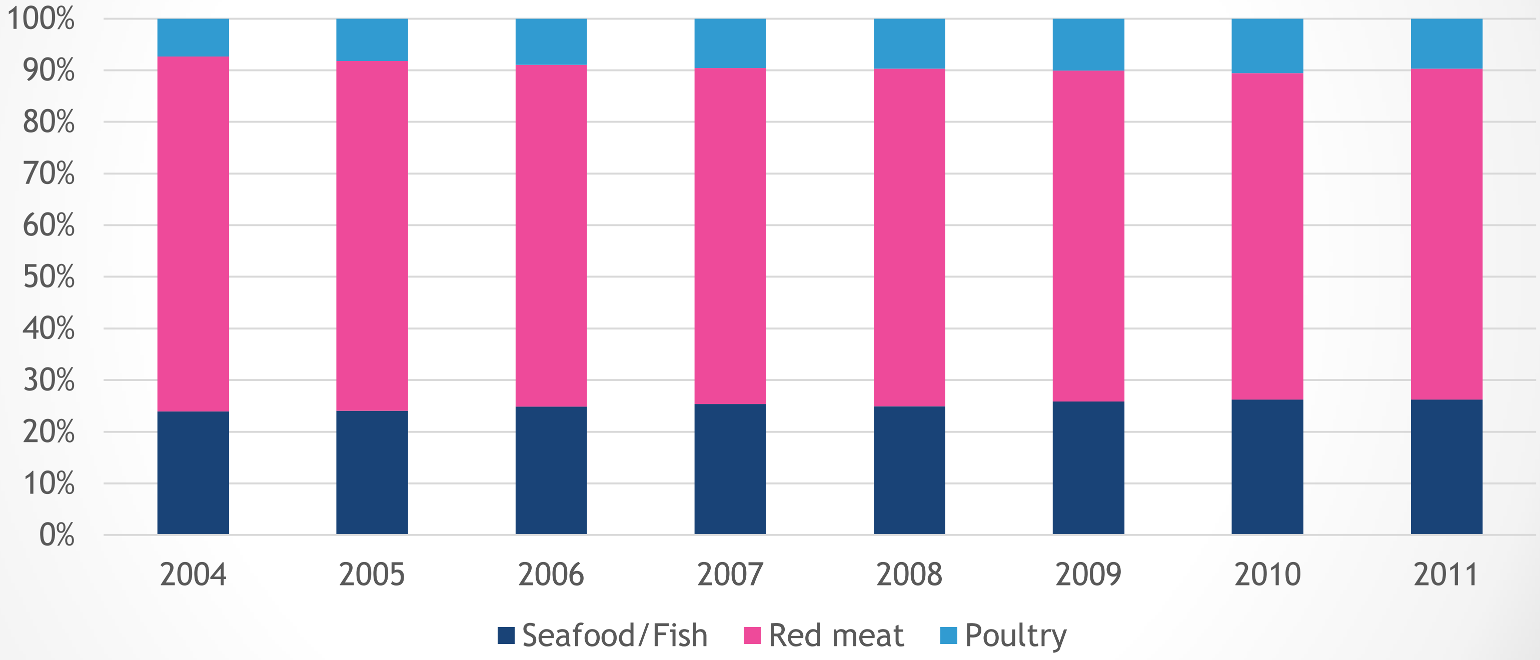
# Yearly Value Shares from the Raw Data Set

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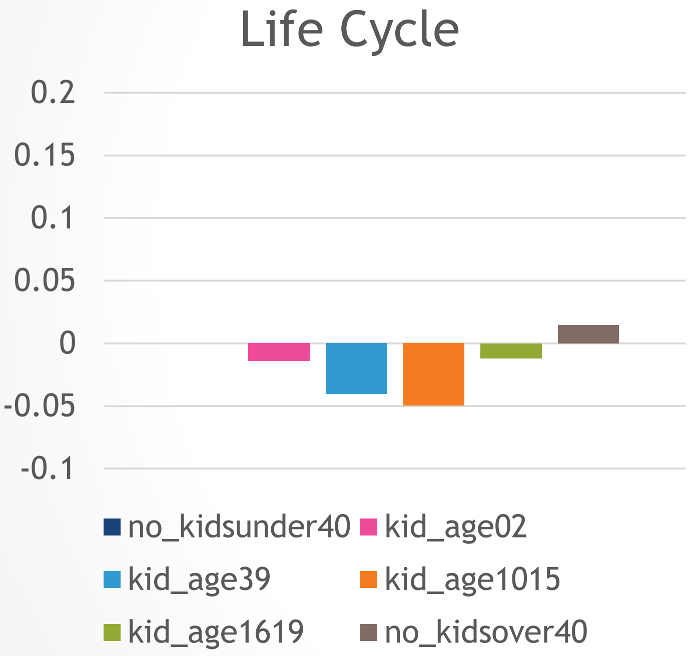
# LA/AIDS Coefficients for Seafood

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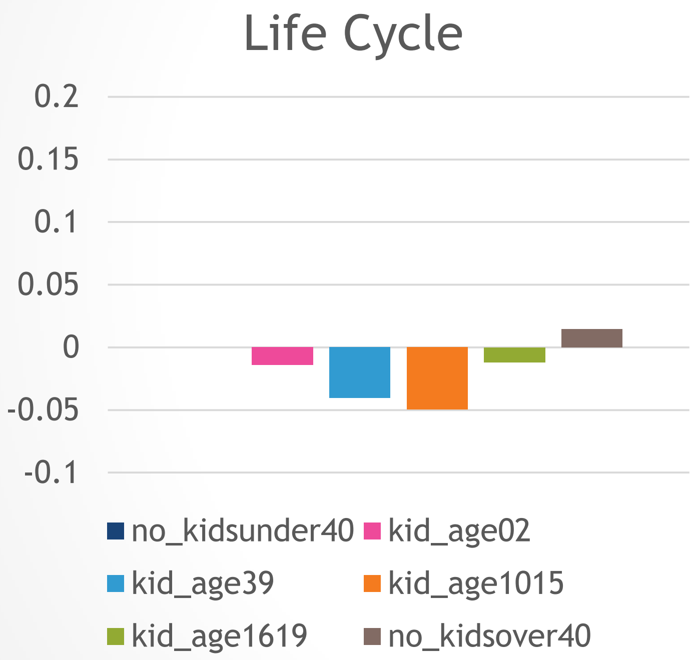
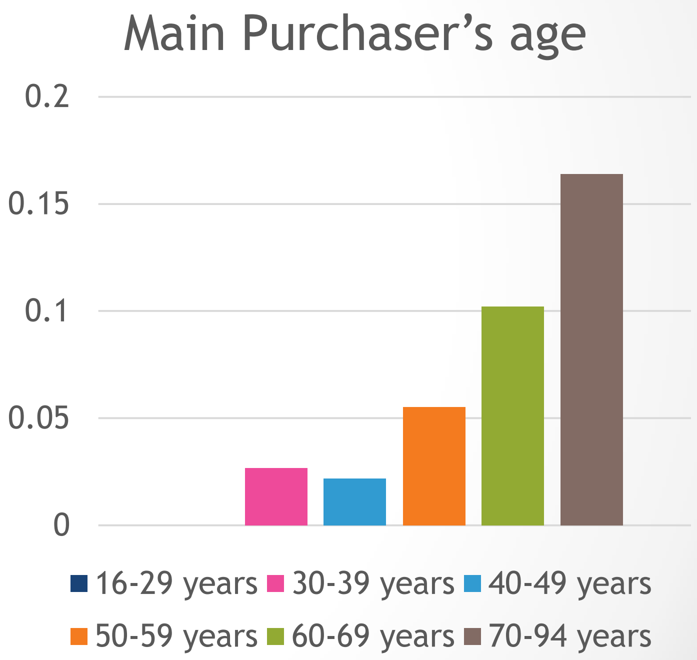
# LA/AIDS Coefficients for Seafood

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# Children and Trend

- When we interact the «Lifecycle» variable with a trend variable (year), we allow the trend to vary for each of the Lifecycle groups

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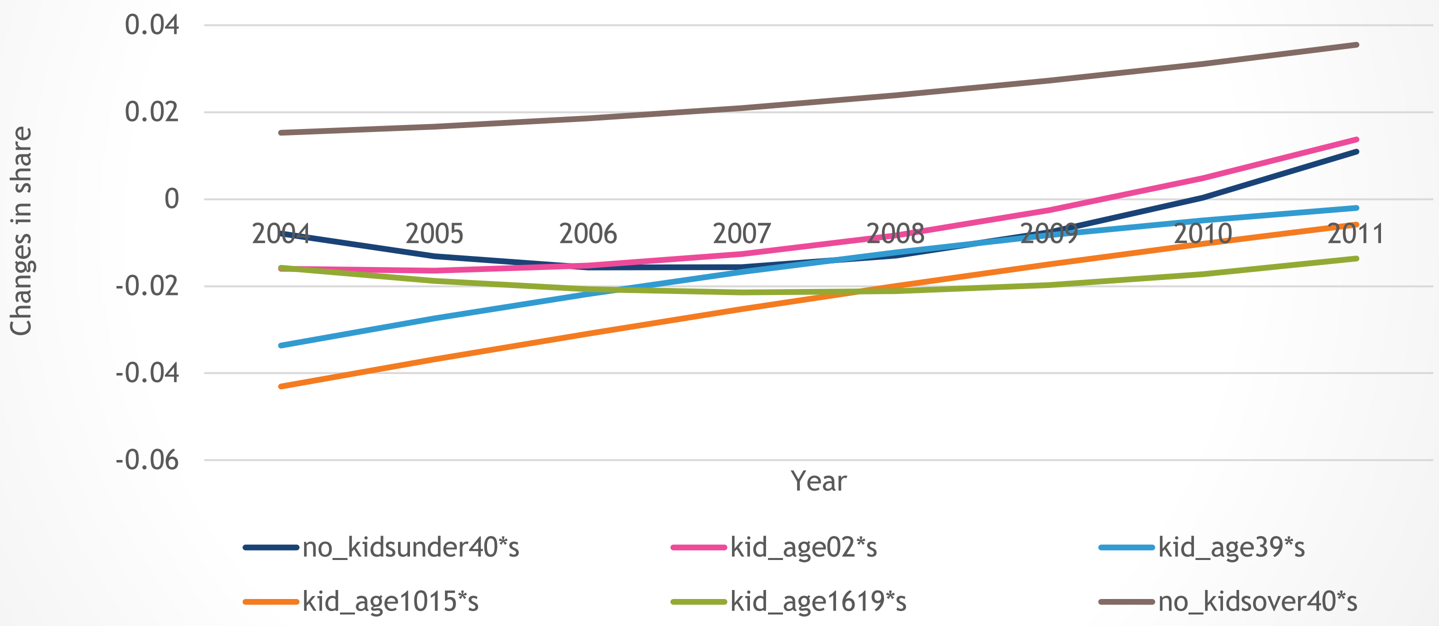
# Estimated “Life Cycle”, Base and Time Trend for Seafood

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# Results

- Children (youngest child 3-15 years old) in the household reduce the consumption of seafood
- But during this period the households with children increased their seafood consumption, except for the households with the  16-18 year old's
- Young households with children have very low seafood consumption

# Thanks a lot for listening!

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