REPORT: COMPARING PRICE AND INCOME ELASTICITIES FOR OLS, AIDS AND ROTTERDAM ESTIMATORS

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In this report, we are going to compare the estimations for price (Marshallian) and income elasticities obtained in three different specifications (OLS, Rotterdam, and AIDS) for the Meat demand data.

Given that amount of results obtained, we are going to present the Marshallian elasticities results for each good. Graph 1 shows the cross and own elasticities for the demand of each good obtained from OLS, Rotterdam and AIDS specification (unrestricted, with and without seasonality). There are some interesting observations from the graphs 1.A to 1.D:

Graph 1: cross and own Marshallian price elasticities for different models (with and without seasonality) separated for good.
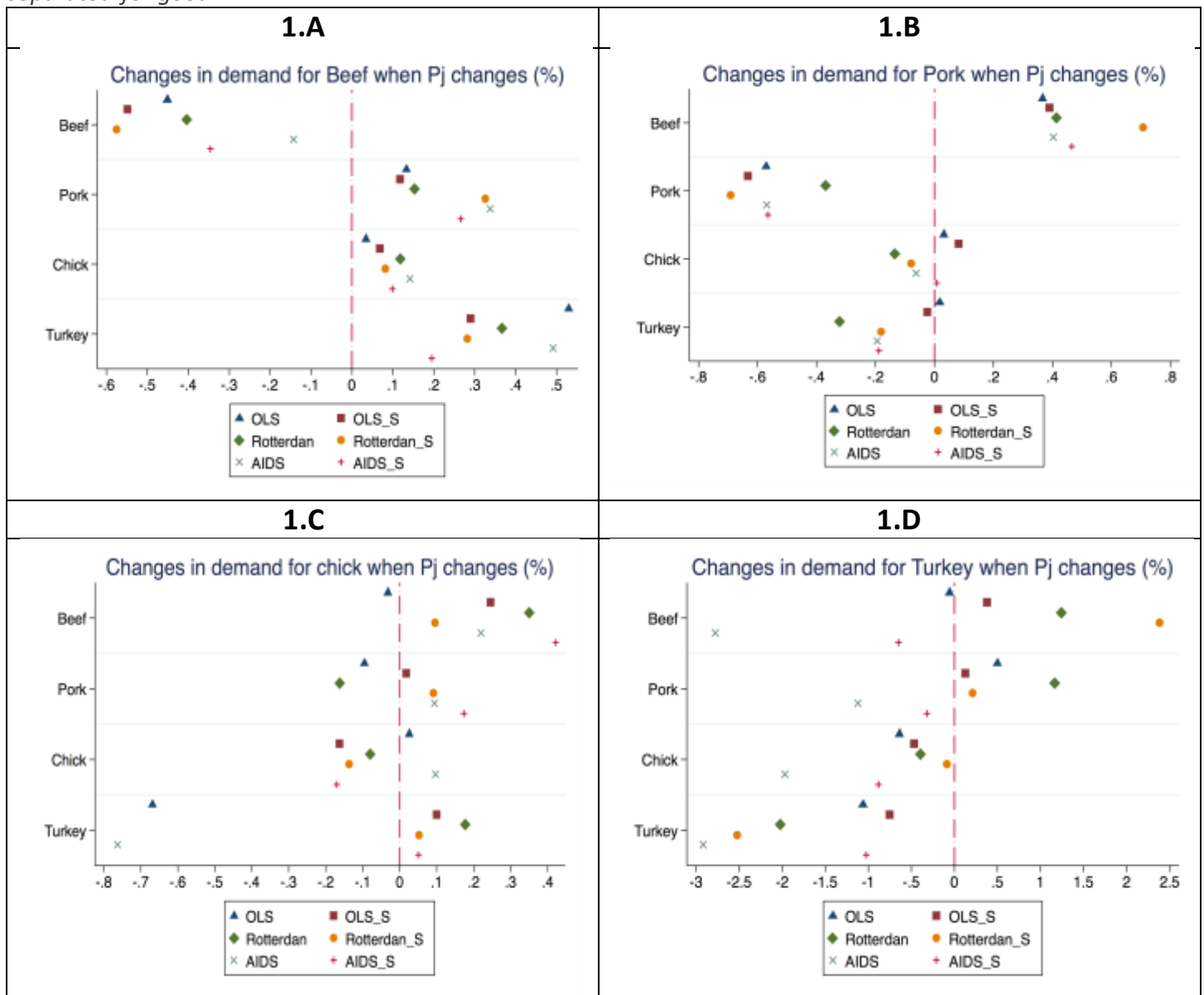

1. Initially, we can see that the elasticities (own and cross) vary between estimators, in some cases the differences are remarkable. One interesting fact is that the elasticities in models when the seasonality was controlled tend to have less extreme values compared to the models that do not account for seasonality.

2. In addition, the OLS, Rotterdam, and AIDS estimators controlled for seasonality tend to be more similar to each other in the sign of the coefficients (maybe not so similar in the magnitude of the effect).

3. The results also show the importance to control for seasonality when you have a good that is clearly seasonal. In our case, the elasticities of the demand of Turkey (own and cross) tend to be more stable, with less extreme values and with sign and magnitude of the effects more similar between models when we deal with the seasonality problem.

4. The demand for beef, pork and chick are inelastic in all models (with and without seasonality), whilst the demand for turkey is elastic in almost all the models except the OLS with seasonality.

5. Regarding the potential type of relation between goods (complements or substitutes) the cross price elasticities results show that:

• Beef and pork are substitutes
• Beef and chick are substitutes
• Beef and turkey are substitutes
• Pork and chick are substitutes in the OLS, OLS with seasonality and AIDS with seasonality specifications, but complements in the others specifications (Rotterdam, Rotterdam with seasonality, and AIDS).
• Pork and turkey are substitutes in certain specifications and complements in others (this is a result difficult to explain)
• Chick and turkey are complements.

The graph 2 shows the income elasticities obtained for the different estimators (with and without seasonality).

Graph 2: Income/expenditure elasticities for different models (with and without seasonality) separated for good.
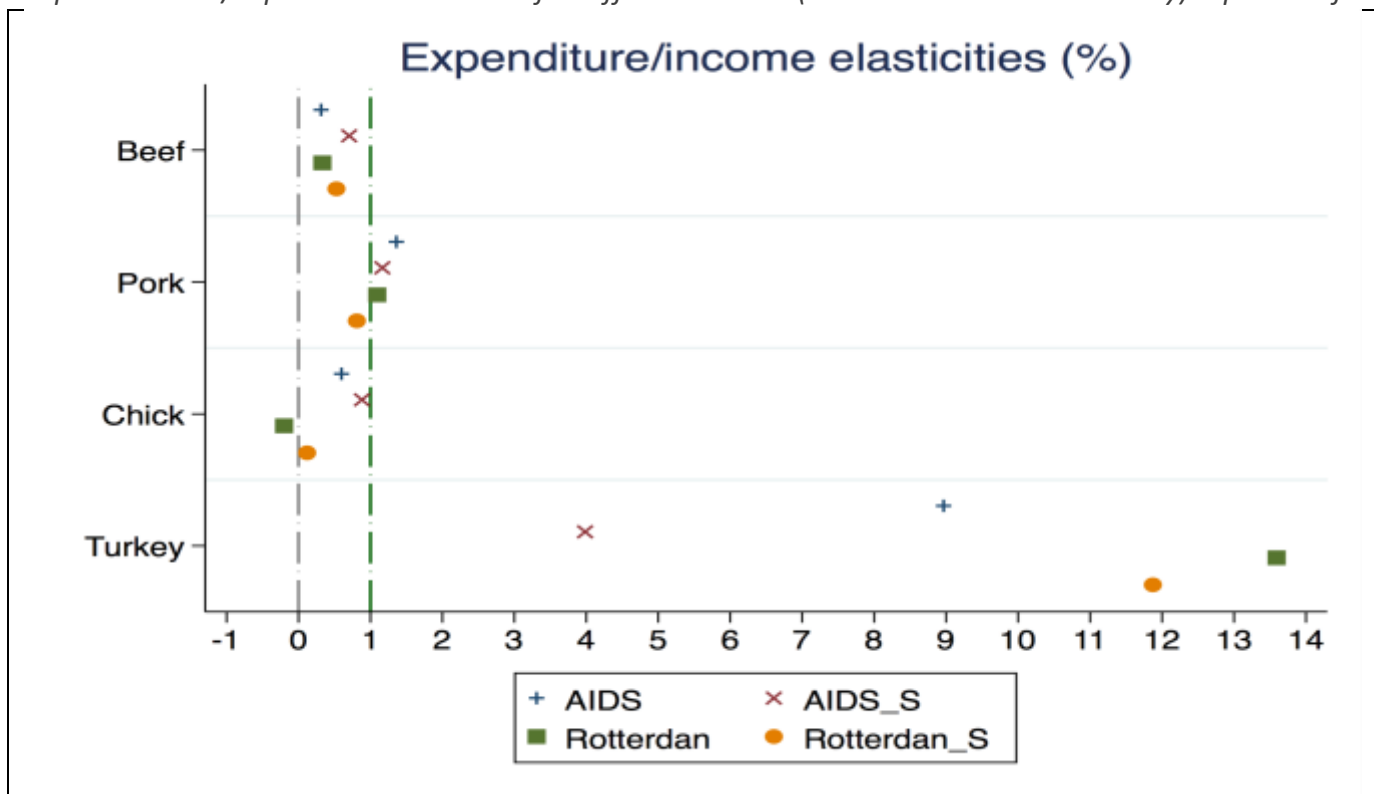
From the graph, we can determine that Beef and chick are necessity goods, whilst pork and turkey are luxury or superior goods, with the latter being apparently the most luxurious.

From the analysis above, I consider that the models that account for seasonality should be preferred, and among those, the AIDS and Rotterdam model will be a good option for the fact that allow to estimate our problem as system and then account for the relationships between products. Finally, under heteroscedasticity the SUR estimator used for AIDS or Rotterdam models is more efficient that an equation by equation OLS.

In this part we are going to compare the results for the different estimators when we impose symmetry and adding up restrictions over the parameters. Graph 3 shows the results of this exercise.

Graph 3: cross and own Marshallian price elasticities for different restricted models (with and without seasonality) separated for good.
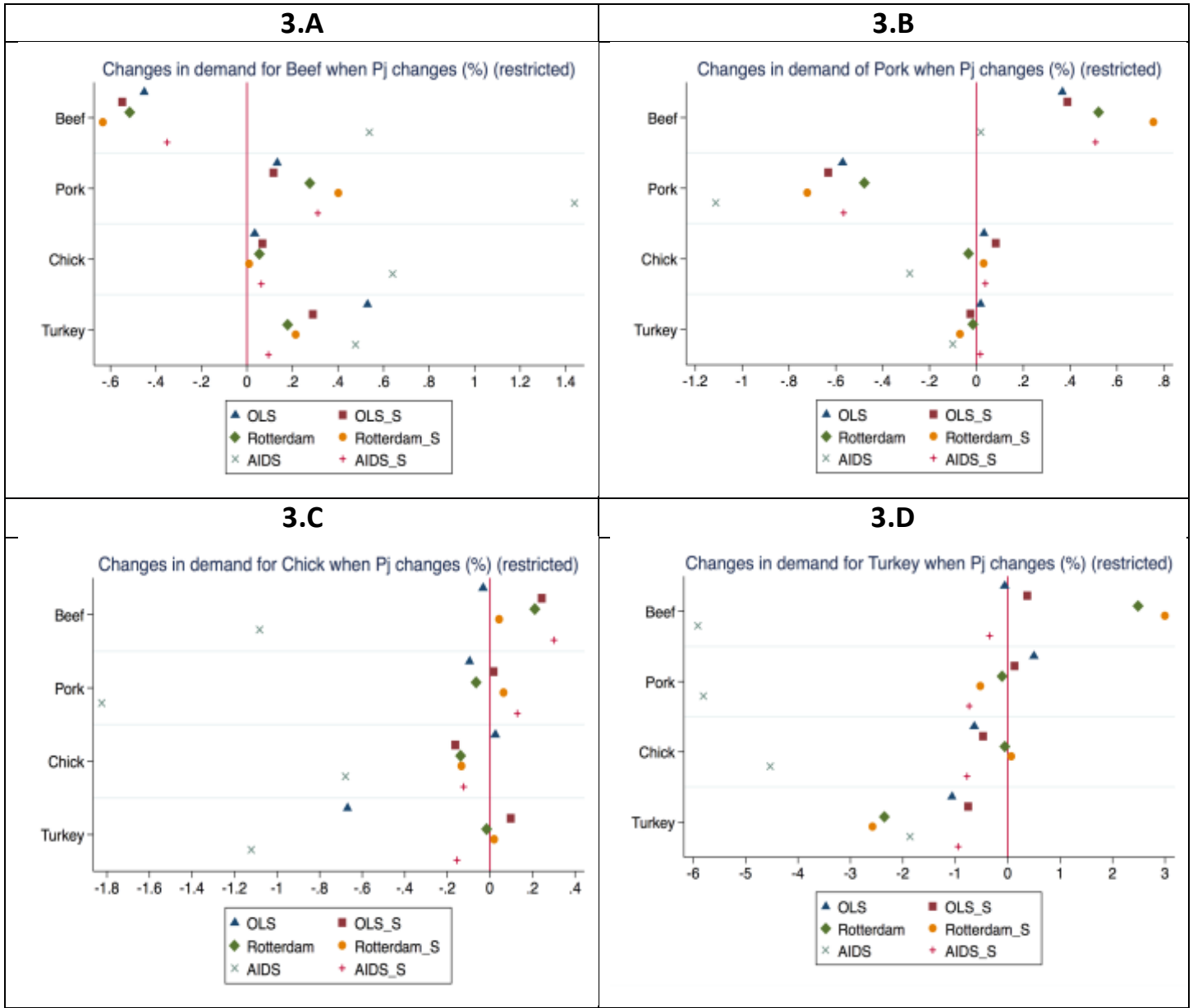

In contrast what we have seen when we compare the unrestricted results, for the restricted results, there is a pretty clear pattern: the AIDS estimator (without seasonality) tends to under or overestimate the own and cross

price elasticities compared to the another models. Once we control for the seasonality the AIDS estimator is closer to the others (see graphs 3A-3D). Other interesting observation for the restricted results are:

1. Similar to the unrestricted case, the demand for beef, pork and chick are inelastic in all models (except the AIDS estimation without seasonality for Pork demand), whilst the demand for turkey is elastic in almost all the models except the OLS and the AIDS with seasonality.

2. Regarding the potential type of relation between goods (complements or substitutes) the cross price elasticities results show that:

    *   Similar to the unrestricted case, Beef and pork are substitutes
    *   Similar to the unrestricted case, Beef and chick are substitutes
    *   Similar to the unrestricted case, Beef and turkey are substitutes
    *   Pork and chick are substitutes in the OLS, OLS with seasonality, AIDS with seasonality, and Rotterdam with seasonality specifications, but complements in the others specifications (Rotterdam, and AIDS).
    *   Pork and turkey are complements in all specifications except OLS and AIDS with seasonality (this is a result difficult to explain)
    *   Chick and turkey are substitutes in all models except AIDS and OLS.

Graph 4: Income/expenditure elasticities for different models in the <u>restricted</u> case (with and without seasonality) separated for good.
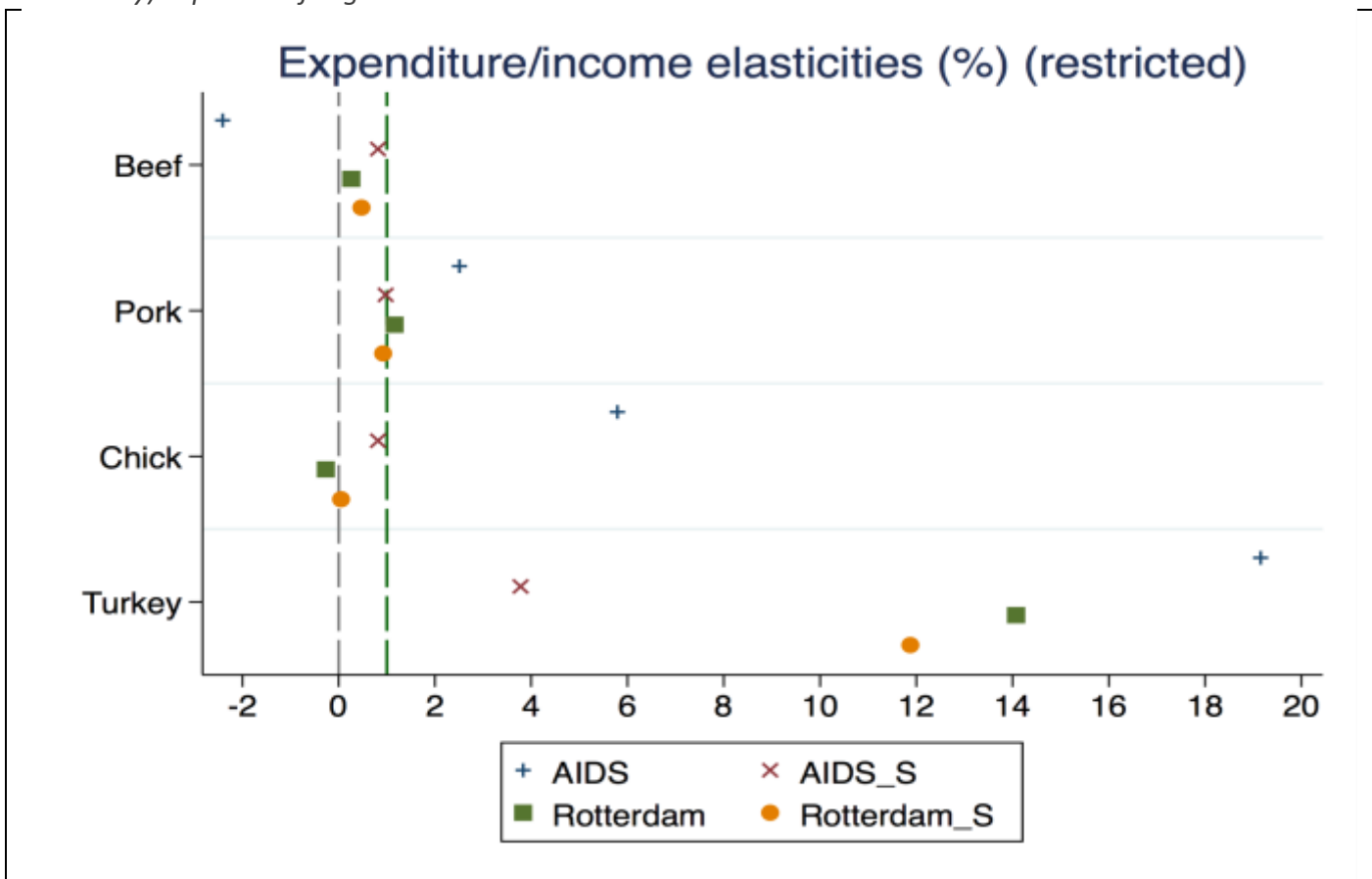
Finally, the expenditure elasticities for the restricted models are quite similar to the unrestricted case, except for the AIDS model, which tends to under or overestimate the results (see graph 4). Here we can say that beef, pork, and chick are necessity goods, whilst Turkey is a luxury good.