PDPE Market Analysis Tool: Price and Income Elasticities

Market prices and households' income vary over time and, jointly with consumer preferences, determine food consumption. Elasticities measure how quantities demanded will adjust in response to a price or income change -- or, reversely, predict price changes as a result of changes in quantity. More formally, an elasticity measures the percentage change of one variable when another variable changes by 1 percent.

What insights can this tool provide?

Good knowledge of elasticities will assist practitioners in making informed decisions in the context of WFP assistance programmes. They allow to gain a sense of how markets and the consumers will react to price and income fluctuations and how the market will respond to food aid influxes. Knowing how food markets react is important since markets are the interface through which individuals gain most access to food and are an essential element for strategies to ensure that the vulnerable segments of the population have access to food.

This knowledge should inform, *inter alia,* WFP's needs assessments and food security analyses, which include an assessment of market conditions. Needs assessments recommend response options, including food aid requirements, where appropriate. Elasticities provide valuable information to support these recommendations.

The questions an elasticity help to answer are: if a drought were to hit the country, how much would prices rise in response to lower production and how would the population react to the higher prices? And if food aid is brought into the country by how much will prices decline? Based on the price change, one could also investigate which groups of the population would mostly be affected and if the vulnerable groups will be able to access alternative food sources (see the Zambia spreadsheet model and the shock-response tool). Elasticities can also provide information on which households and which food stuff to target in food aid programmes.

Food aid will increase the supply of food, and will cause food prices to fall –- to which extent will depend on the elasticity. Reducing prices might be partly an objective of food aid, especially when prices are high. A good understanding of the market conditions and of the actors involved is important to avoid unintended negative impacts on markets.

In summary the questions that elasticities address are:

1. How will prices react to a production shock?
2. How will households respond to prices changes?
3. Is there a staple that can be used to target the vulnerable households, while minimizing market distortions?
4. What impact will food aid supplies have on prices?

How to analyse, interpret and use the data

Elasticities are measured in percentage terms so that the measure does not depend on the variables' units, and is comparable across commodities and countries. Elasticities can be large or small and can be positive or negative. Based on the value of the elasticity, demand is defined to be elastic, inelastic or unit elastic. When quantities respond more than proportionally to a 1 percent change in prices or income, demand is elastic. When the response in the quantity demanded is less than proportional, demand

is inelastic. If the quantity demanded responds equally to changes in price or income, demand is unit elastic.

Three types of elasticities are important in market analysis, namely the own-price elasticity, the income elasticity and the cross-price elasticities. A (*own-)price elasticity* is defined as the percentage change in quantity demanded due to a percentage change in the price of the commodity being considered. Generally, price elasticities are negative. For example, a price elasticity of -1.2 means that a 1 percent price increase will lead to a 1.2 percent decrease in the quantity demanded of the good in question. In this case, the demand response is elastic. Typically, for staple foods the price elasticity of demand lies between -1 and 0, becoming less elastic for households with higher incomes and for staples. For poor developing countries the most common values are found between -0.5 and -0.3.

Price elasticities can be larger than zero, i.e. demand increases despite the higher price. This could be the case for a poor household and a less-preferred staple good. If prices increase and the household is poor, its purchasing power is strongly affected. Consequently the household will have to decrease consumption of less essential food items or commodities and will increase the consumption of the less preferred staple to compensate.

If households' food-specific elasticities are larger than one it means that demand will vary more than proportionally when prices change. More specifically, it entails that households, with elasticities larger than one, will be in a better position to counteract price changes and less vulnerable to them.

Poor households spend high shares of their expenditures on food. This makes them vulnerable to food insecurity as a result of price increases. For individual food items, such as rice and wheat, own-price elasticities can be rather elastic if they can substitute one staple for the other and if consumers don't have strong preferences for one or the other. For the grains food group, however, the elasticity is likely to be more inelastic.

The own-price elasticity can be used to calculate the effect of food aid deliveries on prices by manipulation of the elasticity definition. If food aid deliveries increase the supply of a food staple by 1 percent, the lower the absolute values of the price elasticity the higher the decrease in the price. For example, a price elasticity of -0.5 will yield a reduction in prices of 2 percent (= 1 / -0.5), while a price elasticity of -0.25 implies a price decrease of 4 percent (= 1 / -0.25). Higher price reductions are good for consumers, but may discourage producers and could therefore negatively affect next years' supplies.

An *income elasticity* looks at quantity changes that occur due to income changes. For example, an income elasticity of 1.9, means that a 1 percent increase in income will lead to a 1.9 increase in demand. Income elasticities are usually positive, but can be negative. A negative income elasticity implies that the quantity demanded declines as income increases. This is the case for less preferred foods. Foods with negative income elasticities are generally most suitable for *self-targeting* food aid. Such food is normally hardly consumed by richer households. A self-targeting food will allow targeting of the poor and vulnerable segments of the population only, and ensure that market disruptions are minimized. If food aid supplies are brought into a market, the increased supply will lower the price, but if a self-targeting food is used the food will be consumed by the poor while the richer segments of the population will not be interested in buying it. Note that a self-targeting food item may not always exist,

depending on the general poverty levels and on the location. Richer people might use the less preferred food as animal feed.

A *cross-price elasticity* measures the change in quantity demanded due to a percentage change in the price of another commodity. For example, if the cross-price elasticity between rice and cassava were 0.5, this would mean that if the price of rice were to increase by 1 percent, the quantity demanded of cassava will increase by 0.5 percent. If two goods are substitutes[1], we should expect to see consumers purchase more of the alternative good when the price of its substitute increases, i.e. a positive cross price elasticity. Similarly if the two goods are complements, we should see a price rise in one good cause the demand for both goods to fall, i.e. a negative cross price elasticity.

Example: Household demand parameters by country and household typology.

Two examples illustrate how elasticities can be used. Table 1 tabulates elasticities and budget shares by country. The example in Table 2 adds the household typology dimension.

Households in rural Maharastra (India) mostly consume *jowar* (the local sorghum variety) as their primary staple spending 12.3 percent of the budget share on this food item. The own-price elasticity -0.29. Rice is the secondary staple. Households use 8.2 percent of the household budget to purchase rice and the own-price elasticity is -0.67. Wheat is less preferred. The household budget share spent on wheat is 3.7 percent and the own-price elasticity of -1.12. If the price of wheat were to rise, households would be in a better position to change food item consumption as opposed to an increase in the price of *jowar*. Wheat demand is elastic so if the price rose households would shift away from wheat consumption. In the case of *jowar,* demand is inelastic so poor households would not be able to vary consumption much if prices increased. Thus the household is more vulnerable to jowar price changes and would not manage to reduce demand by much if they face higher prices. In conclusion, for the main staple, budget shares are high and own-price elasticities low.

Table 1: Own price elasticities by primary and secondary food staples

Rural location	Food type	Budget share (%)	Own-price elasticity
Rural Maharastra, India	*Jowar*	12.3	-0.29
	Rice	8.2	-0.67
	Wheat	3.7	-1.12

Source: Deaton A. 1997. *The analysis of household surveys*, pp. 317-318; data were for Pakistan for 1984-85, Rural Maharastra, 1983.

Table 2 includes own-price, cross-price and income elasticities by household type in Bangladesh. The values show that poor urban households are very responsive to wheat price changes, but less to rice price changes. If the price of rice were to increase by 1 percent, households would reduce their consumption of it only by 0.89 percent. On the other hand, if the price of wheat were to increase by 1 percent, households would reduce their consumption of wheat by 2.64 percent. Households are in a much better position to shift away from wheat consumption compared to rice when the price

[1] Two goods are substitutes if one good can replace the use of the other when conditions change as, for example, cassava could replace maize if the price of maize were to rise. Two goods are complements if they need to be used together as, for example, rice and condiments. An increase in the price of rice will also decrease the quantity of condiments consumed.

changes. In other words, if the price of wheat were to increase the impact on poor households would be less severe than if the price of rice were to vary. Wheat is also used as part of household's coping strategies and the cross-price elasticity illustrates this. The cross-price elasticity for wheat with respect to the price of rice is 3.67 and hence very elastic. Therefore, if the price of rice increases by 1 percent, households will revert to wheat by increasing the quantity of wheat demanded by 3.67 percent. Income elasticity of demand for wheat and rice is inelastic for both household groups.

Table 2: Wheat and rice elasticities for Bangladesh by household typology

Household group	Price elasticity of demand			Income elasticity of demand	
	Wheat	Rice	Cross-price[a]	Wheat	Rice
Urban poor	-2.64	-0.89	3.67	0.06	0.51
Urban non-poor	-0.43	-0.44	1.19	0.14	0.08

Source: Dorosh, P. & Haggblade, S. 1997. Shifting sands: The changing case for monetizing project food aid in Bangladesh *World Development* 25(12): 2093-2104.
[a] Elasticity of demand for wheat with respect to the price of rice.

Limitations of the tool

- Generally, elasticity estimates are at national level or for broad subgroups, e.g. urban versus rural, but not for household groups.
- The elasticity estimate might not be available for a specific food item, but only for the broad food group.
- The elasticity estimate is generally obtained for a specific year and is calculated based on a specific household survey. Circumstances might have changed since then.
- The analysis based on elasticities refers only to a first-round effect in the short term and does not address coping mechanisms (except for substitution between foods).

How to calculate the indicator

Correct estimation of elasticities involves econometric analysis, which can prove cumbersome and requires good data and specialised skills, often not available in WFP. Alternatively, ball park figures and non-disaggregated estimates could be used. There are two options. First, one can use existing estimates, as, for example, displayed in Table 4 for different countries and 7 food groups (extracted from the ESR-USDA database). PDPE will also establish a database on elasticities, accessible through the intranet. The patterns revealed in these elasticities can also be used to derive a guesstimate for the elasticity needed for the specific country context (see below). Second, if a more detailed breakdown of elasticities is needed a good reference journal is also the *American Journal of Agricultural Economics*.

Formally, elasticities are defined as follows:

Definition of elasticity

e_{ij} = (Percentage change in variable i) / (Percentage change in variable j)

Own-price elasticity

$e_{own-price}$ = Quantity % change / Price % change

Income elasticity

e_{income} = Quantity % change / Income % change

Cross-price elasticity

$e_{cross-price}$ = Quantity % change of good i/ Price % change of good j

Rough estimates

Table 3 shows the mean and median elasticities and the range for the developing countries[2] by food group.

For example, income elasticities range from 0.11 to 0.62 for the breads and cereals group with an average of 0.44. For poor developing countries values are mostly found between 0.4 and 0.6. Own-price elasticities range from -0.5 to -0.09 with an average of -0.35. For poor developing countries values are mostly found between -0.3 and -0.5. Elasticities for poorer households and countries will tend to be at the higher end of the elasticity range in absolute terms. In fact, the minimum income elasticity and the maximum price elasticity (less elastic) estimates belong to the richest developing countries (the Republic of Korea and Singapore).

Table 3: Ball park income and own price elasticities for developing countries

Food Group	*Income Elasticity*			
	Mean	Median	Minimum	Maximum
Breads, cereals	0.44	0.45	0.11	0.62
Meat	0.69	0.70	0.27	0.86
Fish	0.80	0.80	0.31	1.04
Dairy	0.76	0.76	0.30	0.96
Fats, oils	0.46	0.47	0.17	0.63
Fruits, vegetables	0.56	0.57	0.22	0.71
Other foods	0.69	0.70	0.27	0.86
Food Group	*Price Elasticity*			
	Mean	Median	Minimum	Maximum
Breads, cereals	-0.35	-0.36	-0.50	-0.09
Meat	-0.56	-0.57	-0.69	-0.22
Fish	-0.64	-0.64	-0.84	-0.25
Dairy	-0.61	-0.62	-0.78	-0.24
Fats, oils	-0.37	-0.38	-0.51	-0.14
Fruits, vegetables	-0.45	-0.46	-0.57	-0.18
Other foods	-0.56	-0.56	-0.69	-0.22

Source: Values extracted from the USDA-ESR database, 1996.

At times, the specific elasticities needed are not available for the country analyzed. In that case, the empirical regularities found among price and income elasticities across countries could be used to derive a guesstimate. Figure 1 is a graphical representation of price and income elasticity by per capita income levels (in logs). Very rough estimates for income and price elasticities can be directly read off this graph, according to the per capita GDP level of the country under investigation (please refer to the note below the graph). Alternatively it is possible to plug the country's GDP per capita level into the formula provided below. The values in the formula represent the intercept and the inclination of linear fitted lines portrayed in Figure 1.

[2] The developing countries were selected out of the USDA-ESR database according to the UN classification. In total 75 countries were considered.

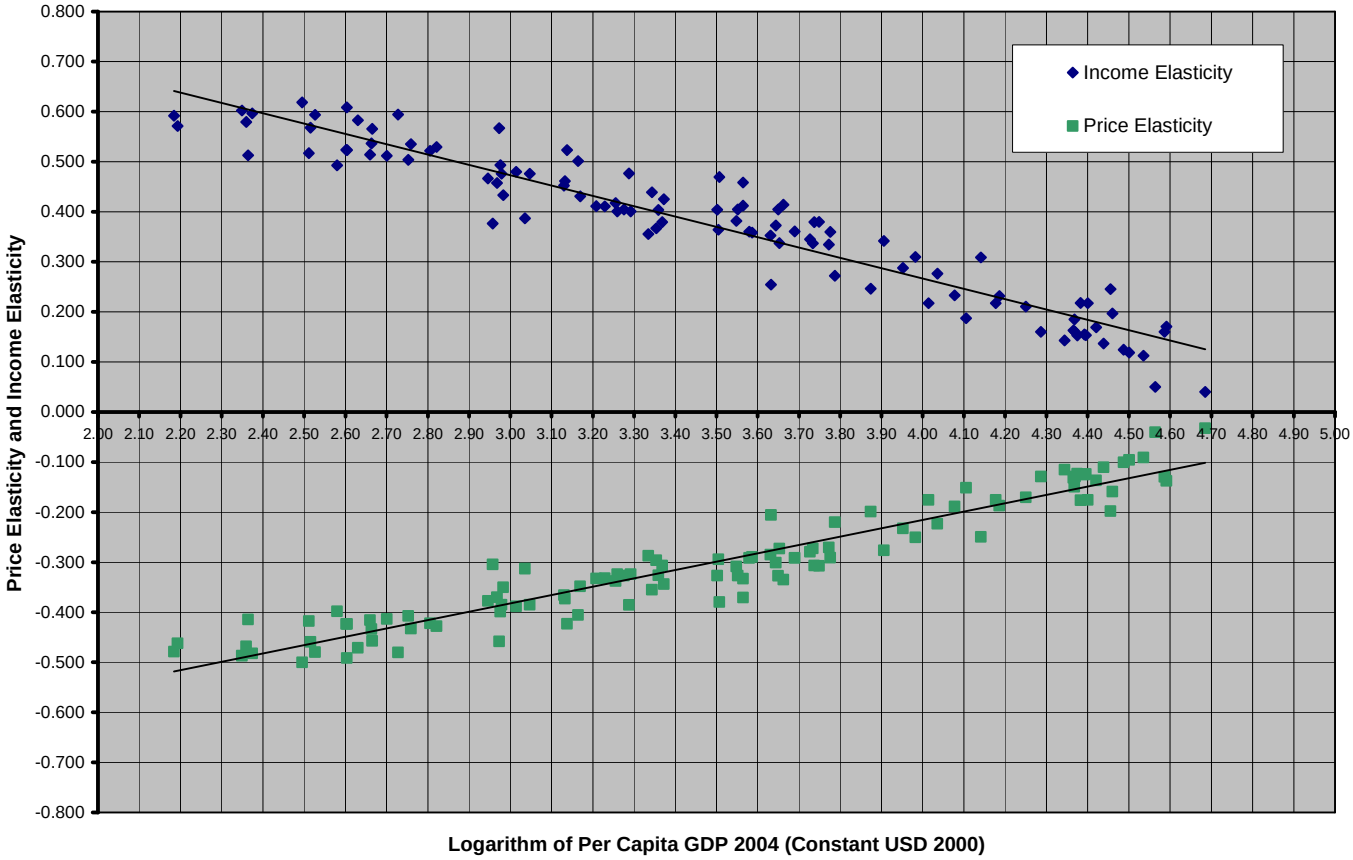
Own-price elasticity

$e_{own-price}$ = [Log of 2004 constant 2000 US$ GDP per Capita*(0.167)] - 0.883

Income elasticity

e_{income} = [Log of 2004 constant 2000 US$ GDP per Capita*(-0.206)] + 1.092

Figure 1: Income and price elasticity for the bread and cereals food group by per capita GDP



Source: USDA-ESR elasticities database, 1996, and GDP data from WDI 2006.
Note: Income and price elasticity estimates for the cereal and bread food groups are extracted from the USDA-ESR database collected in 1996. GDP/capita values are in constant 2000 USD for the year 2004. These values were extracted from the WDI 2006 database. The number of countries for which data was available is 107.

Data needs, data sources

Income and price elasticity estimates

Data needs	Data source
Elasticities	• PDPE database on elasticities Economic research service, United States Department of Agriculture International food consumption patters datasets (See Table 4 and http://www.ers.usda.gov/data/InternationalFoodDemand/

Table 4: Income and own price elasticities by food group per country

Country	*Income Elasticity*							*Price elasticity*						
	Breads, cereals	Meat	Fish	Dairy	Fats, oils	Fruits, vegetables	Other foods	Breads, cereals	Meat	Fish	Dairy	Fats, oils	Fruits, vegetables	Other foods
Albania	0.431	0.734	0.823	0.792	0.462	0.588	0.731	-0.348	-0.593	-0.665	-0.641	-0.374	-0.476	-0.591
Antigua & Barbuda	0.310	0.622	0.688	0.667	0.351	0.493	0.620	-0.251	-0.503	-0.557	-0.539	-0.284	-0.398	-0.502
Argentina	0.246	0.549	0.604	0.587	0.290	0.432	0.547	-0.199	-0.444	-0.489	-0.474	-0.235	-0.349	-0.443
Armenia	0.476	0.748	0.850	0.814	0.500	0.605	0.746	-0.385	-0.605	-0.688	-0.658	-0.404	-0.489	-0.603
Australia	0.143	0.318	0.350	0.340	0.168	0.250	0.317	-0.115	-0.257	-0.283	-0.275	-0.136	-0.202	-0.256
Austria	0.153	0.330	0.364	0.353	0.178	0.260	0.329	-0.124	-0.267	-0.294	-0.285	-0.144	-0.210	-0.266
Azerbaijan	0.493	0.767	0.874	0.835	0.517	0.621	0.764	-0.399	-0.620	-0.706	-0.676	-0.418	-0.502	-0.618
Bahamas	0.113	0.413	0.450	0.438	0.171	0.320	0.411	-0.092	-0.334	-0.364	-0.354	-0.138	-0.258	-0.333
Bahrain	0.309	0.625	0.691	0.670	0.351	0.495	0.623	-0.250	-0.505	-0.559	-0.541	-0.284	-0.400	-0.504
Bangladesh	0.523	0.784	0.903	0.859	0.543	0.638	0.781	-0.423	-0.634	-0.731	-0.695	-0.440	-0.516	-0.632
Barbados	0.175	0.273	0.311	0.297	0.183	0.221	0.272	-0.141	-0.221	-0.251	-0.240	-0.148	-0.179	-0.220
Belarus	0.411	0.673	0.759	0.729	0.436	0.542	0.671	-0.332	-0.544	-0.614	-0.590	-0.353	-0.438	-0.542
Belgium	0.163	0.345	0.381	0.369	0.188	0.273	0.344	-0.132	-0.279	-0.308	-0.299	-0.152	-0.220	-0.278
Belize	0.412	0.685	0.771	0.741	0.439	0.551	0.683	-0.333	-0.554	-0.623	-0.599	-0.355	-0.445	-0.552
Benin	0.568	0.812	0.956	0.900	0.584	0.665	0.809	-0.459	-0.657	-0.773	-0.728	-0.472	-0.538	-0.654
Bermuda	0.104	0.281	0.308	0.300	0.133	0.220	0.281	-0.084	-0.228	-0.249	-0.242	-0.108	-0.178	-0.227
Bolivia	0.480	0.754	0.857	0.820	0.504	0.610	0.751	-0.388	-0.610	-0.693	-0.663	-0.408	-0.493	-0.608
Botswana	0.458	0.700	0.801	0.764	0.478	0.568	0.697	-0.371	-0.566	-0.648	-0.618	-0.387	-0.459	-0.564
Brazil	0.404	0.663	0.747	0.718	0.429	0.533	0.661	-0.327	-0.536	-0.604	-0.581	-0.347	-0.431	-0.534
Bulgaria	0.401	0.662	0.745	0.716	0.426	0.532	0.660	-0.324	-0.535	-0.603	-0.579	-0.345	-0.430	-0.533
Cameroon	0.529	0.761	0.893	0.842	0.545	0.623	0.758	-0.428	-0.615	-0.722	-0.681	-0.441	-0.504	-0.613
Canada	0.155	0.302	0.335	0.324	0.174	0.240	0.301	-0.125	-0.245	-0.271	-0.262	-0.140	-0.194	-0.244
Chile	0.379	0.625	0.704	0.676	0.403	0.502	0.622	-0.307	-0.505	-0.569	-0.547	-0.326	-0.406	-0.503
Congo	0.567	0.794	0.949	0.887	0.581	0.653	0.791	-0.459	-0.642	-0.768	-0.717	-0.470	-0.528	-0.639
Cote d'Ivoire	0.535	0.767	0.902	0.850	0.551	0.628	0.764	-0.433	-0.620	-0.729	-0.687	-0.445	-0.508	-0.618
Czech Republic	0.272	0.507	0.564	0.545	0.300	0.404	0.506	-0.220	-0.410	-0.456	-0.441	-0.243	-0.326	-0.409
Denmark	0.124	0.262	0.289	0.281	0.143	0.207	0.261	-0.100	-0.212	-0.234	-0.227	-0.116	-0.167	-0.211
Dominica	0.382	0.671	0.750	0.724	0.413	0.537	0.669	-0.309	-0.543	-0.607	-0.585	-0.334	-0.434	-0.541
Ecuador	0.501	0.754	0.867	0.825	0.521	0.613	0.751	-0.405	-0.609	-0.701	-0.667	-0.421	-0.496	-0.607
Egypt	0.411	0.685	0.770	0.741	0.438	0.550	0.683	-0.332	-0.554	-0.623	-0.599	-0.354	-0.445	-0.552
Estonia	0.345	0.606	0.678	0.654	0.374	0.485	0.604	-0.279	-0.490	-0.548	-0.529	-0.302	-0.392	-0.489
Fiji	0.367	0.651	0.727	0.701	0.398	0.520	0.649	-0.297	-0.526	-0.587	-0.567	-0.322	-0.420	-0.525
Finland	0.217	0.418	0.464	0.448	0.242	0.332	0.417	-0.176	-0.338	-0.375	-0.363	-0.196	-0.268	-0.337
France	0.159	0.353	0.389	0.377	0.187	0.278	0.352	-0.129	-0.286	-0.314	-0.305	-0.152	-0.225	-0.285
Gabon	0.358	0.605	0.680	0.654	0.384	0.486	0.603	-0.290	-0.490	-0.550	-0.529	-0.310	-0.393	-0.488
Georgia	0.467	0.722	0.823	0.787	0.488	0.585	0.719	-0.377	-0.584	-0.666	-0.636	-0.395	-0.473	-0.582
Germany	0.153	0.328	0.362	0.351	0.177	0.259	0.327	-0.124	-0.265	-0.292	-0.284	-0.143	-0.209	-0.264
Greece	0.233	0.485	0.535	0.519	0.267	0.383	0.483	-0.188	-0.392	-0.433	-0.420	-0.216	-0.310	-0.391

Country	*Income Elasticity*							*Price elasticity*						
	Breads, cereals	Meat	Fish	Dairy	Fats, oils	Fruits, vegetables	Other foods	Breads, cereals	Meat	Fish	Dairy	Fats, oils	Fruits, vegetables	Other foods
Grenada	0.360	0.651	0.725	0.700	0.393	0.519	0.649	-0.291	-0.526	-0.586	-0.566	-0.318	-0.420	-0.525
Guinea	0.493	0.730	0.845	0.802	0.511	0.595	0.727	-0.398	-0.591	-0.683	-0.649	-0.413	-0.481	-0.588
Hong Kong	0.137	0.270	0.299	0.289	0.154	0.214	0.269	-0.110	-0.218	-0.242	-0.234	-0.124	-0.173	-0.218
Hungary	0.337	0.576	0.645	0.622	0.362	0.462	0.574	-0.272	-0.466	-0.522	-0.503	-0.293	-0.373	-0.464
Iceland	0.118	0.268	0.294	0.286	0.140	0.210	0.267	-0.096	-0.216	-0.238	-0.231	-0.114	-0.170	-0.216
Indonesia	0.376	0.730	0.809	0.783	0.421	0.579	0.728	-0.304	-0.590	-0.654	-0.633	-0.340	-0.468	-0.588
Iran	0.404	0.635	0.722	0.691	0.425	0.514	0.633	-0.327	-0.514	-0.584	-0.559	-0.343	-0.415	-0.512
Ireland	0.245	0.461	0.512	0.495	0.271	0.367	0.460	-0.198	-0.373	-0.414	-0.401	-0.219	-0.297	-0.372
Israel	0.211	0.424	0.469	0.455	0.239	0.336	0.423	-0.170	-0.343	-0.380	-0.368	-0.193	-0.272	-0.342
Italy	0.160	0.340	0.375	0.364	0.185	0.268	0.339	-0.129	-0.275	-0.303	-0.294	-0.150	-0.217	-0.274
Jamaica	0.470	0.732	0.834	0.797	0.492	0.593	0.730	-0.380	-0.592	-0.674	-0.645	-0.398	-0.479	-0.590
Japan	0.160	0.312	0.345	0.334	0.179	0.247	0.311	-0.129	-0.252	-0.279	-0.270	-0.145	-0.200	-0.251
Jordan	0.477	0.743	0.846	0.809	0.500	0.601	0.740	-0.385	-0.601	-0.684	-0.654	-0.404	-0.486	-0.599
Kazakhstan	0.401	0.672	0.755	0.727	0.428	0.540	0.670	-0.324	-0.544	-0.611	-0.588	-0.346	-0.436	-0.542
Kenya	0.583	0.808	0.975	0.906	0.596	0.665	0.805	-0.471	-0.654	-0.788	-0.733	-0.482	-0.538	-0.651
Korea	0.187	0.478	0.524	0.510	0.234	0.374	0.477	-0.151	-0.387	-0.424	-0.412	-0.189	-0.302	-0.385
Kyrgyzstan	0.517	0.761	0.882	0.837	0.535	0.620	0.758	-0.418	-0.615	-0.713	-0.677	-0.432	-0.502	-0.613
Latvia	0.404	0.665	0.749	0.720	0.430	0.535	0.662	-0.327	-0.537	-0.606	-0.582	-0.348	-0.432	-0.536
Lebanon	0.380	0.673	0.752	0.725	0.413	0.538	0.671	-0.307	-0.544	-0.608	-0.586	-0.334	-0.435	-0.543
Lithuania	0.373	0.644	0.721	0.695	0.401	0.516	0.642	-0.301	-0.521	-0.583	-0.562	-0.325	-0.417	-0.519
Luxembourg	0.040	0.133	0.146	0.142	0.057	0.104	0.133	-0.032	-0.108	-0.118	-0.115	-0.046	-0.084	-0.108
Macedonia	0.417	0.685	0.773	0.742	0.443	0.552	0.683	-0.338	-0.554	-0.625	-0.600	-0.359	-0.446	-0.553
Madagascar	0.579	0.827	0.975	0.917	0.596	0.678	0.824	-0.469	-0.669	-0.788	-0.742	-0.482	-0.548	-0.666
Malawi	0.592	0.828	0.991	0.925	0.606	0.681	0.825	-0.479	-0.670	-0.801	-0.748	-0.490	-0.551	-0.667
Mali	0.596	0.827	0.998	0.928	0.610	0.681	0.824	-0.482	-0.669	-0.807	-0.750	-0.493	-0.551	-0.666
Mauritius	0.254	0.438	0.491	0.473	0.274	0.351	0.437	-0.206	-0.354	-0.397	-0.382	-0.221	-0.284	-0.353
Mexico	0.360	0.630	0.704	0.679	0.389	0.504	0.628	-0.291	-0.510	-0.570	-0.549	-0.315	-0.408	-0.508
Moldova	0.524	0.760	0.888	0.839	0.540	0.621	0.758	-0.423	-0.615	-0.718	-0.679	-0.437	-0.503	-0.613
Mongolia	0.565	0.824	0.960	0.909	0.584	0.673	0.821	-0.457	-0.666	-0.777	-0.735	-0.472	-0.544	-0.664
Morocco	0.452	0.694	0.793	0.757	0.472	0.563	0.691	-0.366	-0.561	-0.642	-0.613	-0.382	-0.455	-0.559
Nepal	0.513	0.798	0.909	0.869	0.537	0.646	0.795	-0.415	-0.645	-0.735	-0.703	-0.435	-0.522	-0.643
Netherlands	0.185	0.378	0.418	0.405	0.211	0.299	0.377	-0.149	-0.306	-0.338	-0.327	-0.170	-0.242	-0.305
New Zealand	0.217	0.419	0.465	0.450	0.242	0.333	0.418	-0.176	-0.339	-0.376	-0.364	-0.196	-0.269	-0.338
Nigeria	0.608	0.843	1.018	0.946	0.622	0.694	0.840	-0.492	-0.682	-0.823	-0.765	-0.503	-0.562	-0.679
Norway	0.170	0.344	0.381	0.369	0.193	0.272	0.343	-0.138	-0.278	-0.308	-0.298	-0.156	-0.220	-0.277
Oman	0.288	0.538	0.598	0.578	0.318	0.428	0.537	-0.233	-0.435	-0.484	-0.468	-0.257	-0.346	-0.434
Pakistan	0.504	0.772	0.883	0.843	0.526	0.626	0.770	-0.407	-0.625	-0.714	-0.682	-0.425	-0.507	-0.622
Paraguay	0.523	0.765	0.890	0.843	0.541	0.625	0.762	-0.423	-0.619	-0.720	-0.682	-0.437	-0.505	-0.616
Peru	0.439	0.699	0.792	0.759	0.462	0.564	0.697	-0.355	-0.565	-0.641	-0.614	-0.374	-0.456	-0.563
Philippines	0.387	0.701	0.781	0.754	0.423	0.559	0.698	-0.313	-0.567	-0.631	-0.610	-0.342	-0.452	-0.565
Poland	0.361	0.617	0.692	0.666	0.388	0.495	0.615	-0.292	-0.499	-0.559	-0.539	-0.313	-0.400	-0.498

Country	*Income Elasticity*							*Price elasticity*						
	Breads, cereals	Meat	Fish	Dairy	Fats, oils	Fruits, vegetables	Other foods	Breads, cereals	Meat	Fish	Dairy	Fats, oils	Fruits, vegetables	Other foods
Portugal	0.217	0.471	0.519	0.504	0.253	0.371	0.470	-0.176	-0.381	-0.420	-0.408	-0.205	-0.300	-0.380
Qatar	0.261	0.523	0.579	0.561	0.295	0.414	0.522	-0.211	-0.423	-0.468	-0.453	-0.239	-0.335	-0.422
Romania	0.355	0.640	0.714	0.689	0.388	0.511	0.638	-0.287	-0.518	-0.577	-0.557	-0.314	-0.413	-0.516
Russia	0.403	0.657	0.742	0.712	0.428	0.529	0.655	-0.326	-0.532	-0.600	-0.576	-0.346	-0.428	-0.530
Senegal	0.536	0.787	0.914	0.866	0.554	0.642	0.784	-0.434	-0.636	-0.739	-0.701	-0.448	-0.519	-0.634
Sierra Leone	0.571	0.802	0.957	0.895	0.586	0.659	0.799	-0.462	-0.648	-0.774	-0.724	-0.474	-0.533	-0.646
Singapore	0.218	0.451	0.498	0.483	0.249	0.356	0.450	-0.176	-0.365	-0.403	-0.391	-0.202	-0.288	-0.364
Slovakia	0.338	0.593	0.663	0.639	0.366	0.474	0.591	-0.273	-0.480	-0.536	-0.517	-0.296	-0.384	-0.478
Slovenia	0.277	0.516	0.574	0.555	0.305	0.411	0.515	-0.224	-0.418	-0.464	-0.449	-0.247	-0.332	-0.416
Spain	0.232	0.470	0.519	0.503	0.263	0.372	0.468	-0.187	-0.380	-0.420	-0.407	-0.213	-0.300	-0.379
Sri Lanka	0.433	0.746	0.836	0.805	0.466	0.598	0.744	-0.350	-0.603	-0.676	-0.651	-0.377	-0.483	-0.602
St. Kitts & Nevis	0.286	0.597	0.659	0.639	0.328	0.472	0.595	-0.231	-0.483	-0.533	-0.517	-0.266	-0.381	-0.481
St. Lucia	0.352	0.662	0.736	0.711	0.390	0.527	0.660	-0.285	-0.536	-0.595	-0.575	-0.315	-0.426	-0.534
St.Vincent & Grenadines	0.404	0.684	0.767	0.739	0.433	0.549	0.681	-0.327	-0.553	-0.620	-0.597	-0.350	-0.444	-0.551
Swaziland	0.461	0.679	0.788	0.747	0.477	0.554	0.677	-0.373	-0.549	-0.637	-0.604	-0.386	-0.448	-0.547
Sweden	0.197	0.384	0.425	0.411	0.221	0.304	0.382	-0.159	-0.310	-0.344	-0.333	-0.178	-0.246	-0.309
Switzerland	0.112	0.273	0.300	0.291	0.137	0.214	0.272	-0.091	-0.221	-0.242	-0.236	-0.111	-0.173	-0.220
Syria	0.476	0.723	0.829	0.791	0.496	0.587	0.721	-0.385	-0.585	-0.671	-0.639	-0.401	-0.475	-0.583
Tajikistan	0.602	0.835	1.008	0.937	0.616	0.688	0.832	-0.487	-0.676	-0.815	-0.758	-0.498	-0.556	-0.673
Tanzania	0.619	0.859	1.035	0.963	0.633	0.707	0.856	-0.500	-0.695	-0.837	-0.779	-0.512	-0.572	-0.692
Thailand	0.425	0.697	0.785	0.755	0.451	0.561	0.694	-0.344	-0.563	-0.635	-0.610	-0.365	-0.453	-0.561
Trinidad & Tobago	0.342	0.612	0.682	0.658	0.372	0.488	0.610	-0.276	-0.495	-0.552	-0.532	-0.301	-0.395	-0.493
Tunisia	0.379	0.602	0.683	0.654	0.399	0.486	0.600	-0.307	-0.487	-0.552	-0.529	-0.323	-0.393	-0.485
Turkey	0.364	0.648	0.723	0.698	0.396	0.518	0.646	-0.294	-0.524	-0.585	-0.564	-0.320	-0.419	-0.522
Turkmenistan	0.567	0.799	0.950	0.890	0.581	0.656	0.796	-0.458	-0.646	-0.768	-0.720	-0.470	-0.530	-0.643
Ukraine	0.458	0.711	0.810	0.775	0.479	0.576	0.708	-0.370	-0.575	-0.655	-0.626	-0.388	-0.466	-0.573
United Kingdom	0.169	0.351	0.387	0.375	0.194	0.277	0.350	-0.137	-0.284	-0.313	-0.304	-0.157	-0.224	-0.283
United States	0.050	0.110	0.121	0.117	0.059	0.086	0.109	-0.040	-0.089	-0.098	-0.095	-0.047	-0.070	-0.088
Uruguay	0.335	0.596	0.665	0.642	0.364	0.476	0.594	-0.271	-0.482	-0.538	-0.519	-0.294	-0.385	-0.481
Uzbekistan	0.522	0.761	0.886	0.839	0.539	0.622	0.758	-0.422	-0.616	-0.717	-0.679	-0.436	-0.503	-0.613
Venezuela	0.414	0.691	0.777	0.748	0.442	0.555	0.689	-0.335	-0.559	-0.628	-0.605	-0.357	-0.449	-0.557
Vietnam	0.512	0.784	0.897	0.856	0.534	0.636	0.781	-0.414	-0.633	-0.725	-0.692	-0.432	-0.514	-0.631
Yemen	0.594	0.833	0.995	0.930	0.609	0.685	0.830	-0.480	-0.674	-0.805	-0.752	-0.492	-0.554	-0.671
Zambia	0.594	0.833	0.994	0.930	0.608	0.685	0.830	-0.480	-0.674	-0.804	-0.752	-0.492	-0.554	-0.671
Zimbabwe	0.514	0.734	0.865	0.814	0.529	0.602	0.731	-0.416	-0.594	-0.700	-0.658	-0.428	-0.487	-0.591

Source: USDA database collected in 1996 (http://www.ers.usda.gov/data/InternationalFoodDemand/)

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