

The Role of Income in Agrifood Trade: A Progress Report

Zahoor Haq

Food, Agricultural and Resource Economics

U of Guelph and

Economist, OMAFRA

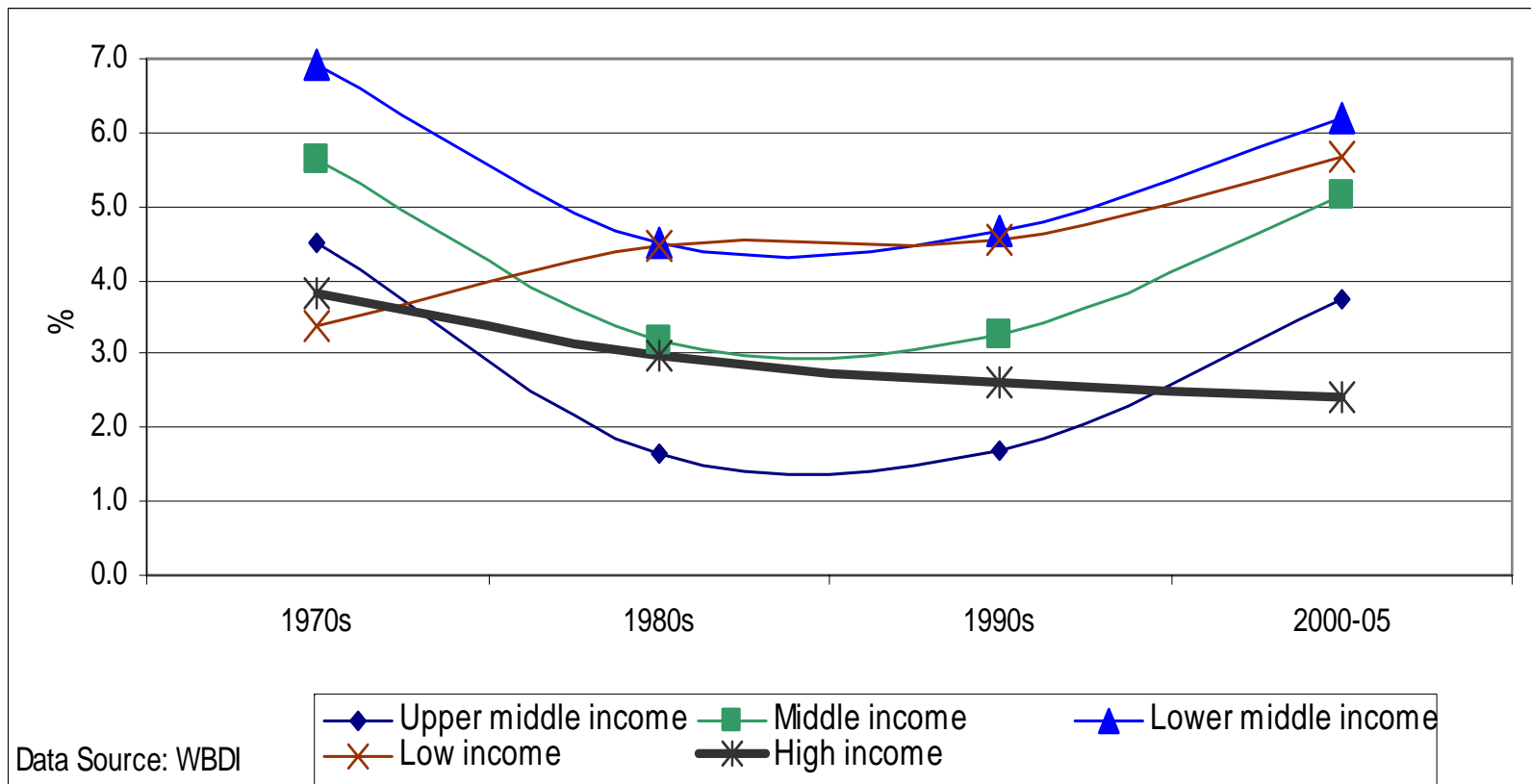
Agenda

- Background
 - Objective
- Empirical Model
- Estimation Issues
- Data
- Preliminary Results
- Conclusions

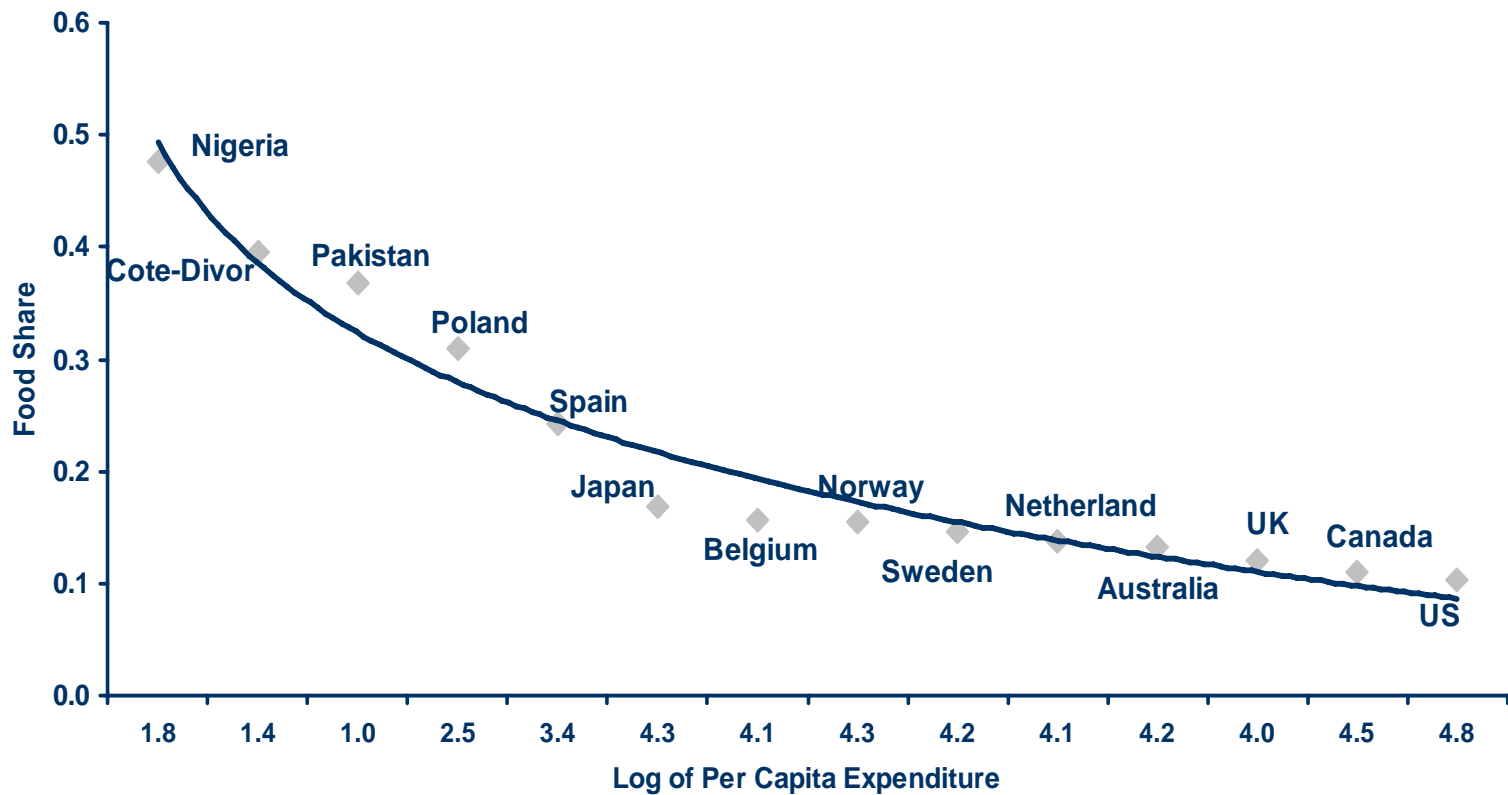
Background

- Theoretical Considerations
 - Current Structure of Trade
 - Intra industry
 - Trade between countries with similar relative endowments
 - Product differentiation
- Income growth differs across development spectrum
 - As income grows, structure of preferences change

GDP Growth across the Development Spectrum (%)



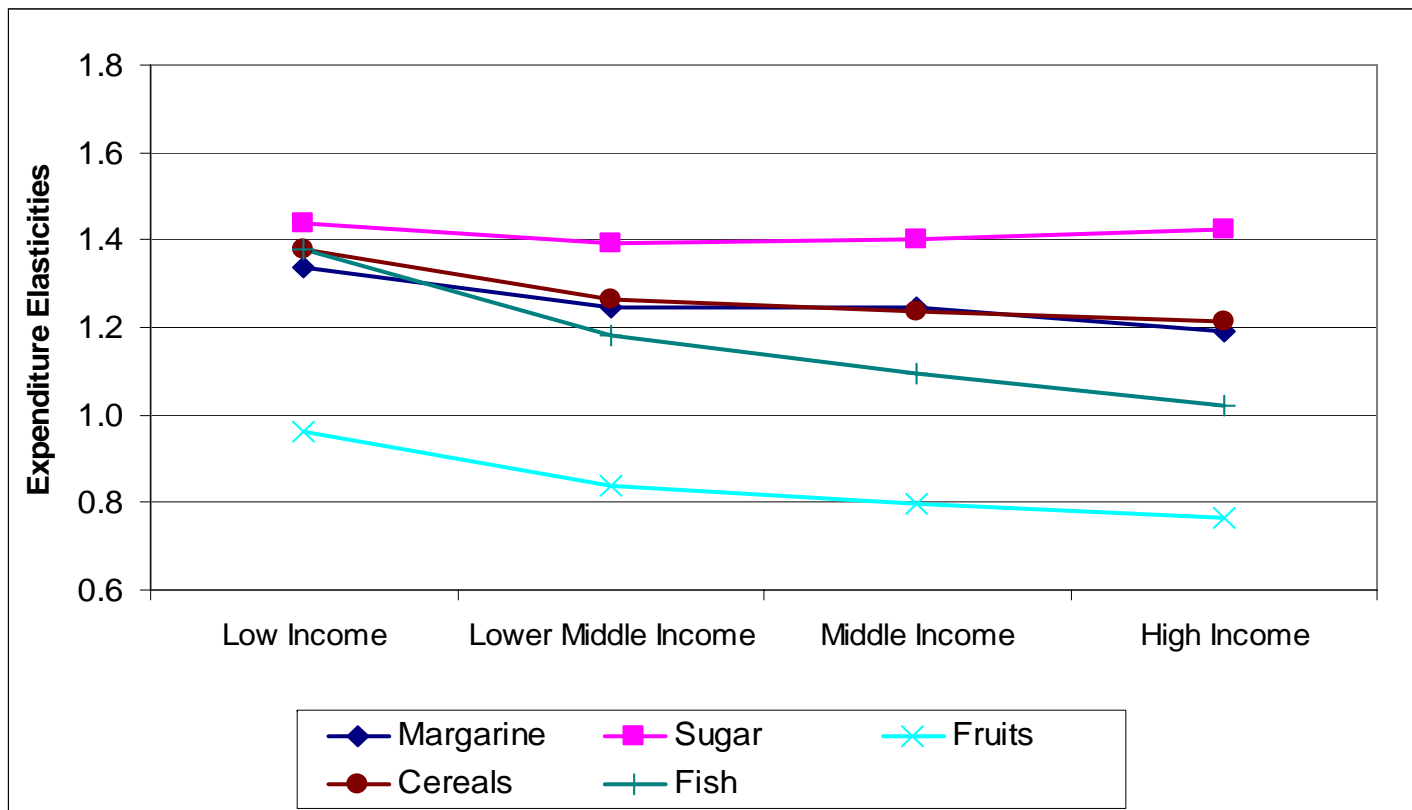
Fitted & Given Shares of Food Expenditure



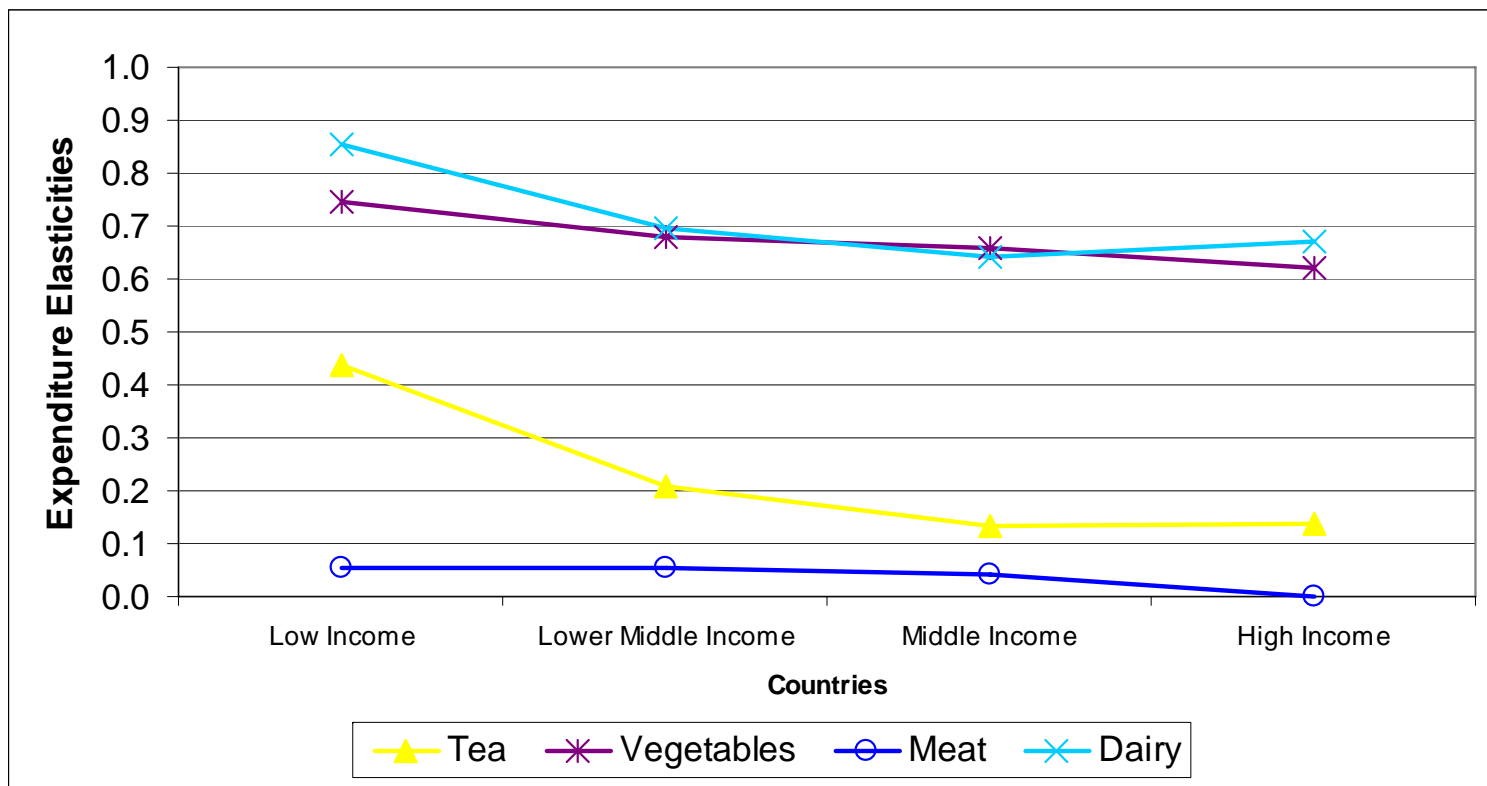
Background

- Expenditure elasticities
 - Differ across development spectrum

Expenditure Elasticities across the Development Spectrum



Expenditure Elasticities across the Development Spectrum



Background

- Expenditure elasticities
 - Differ across development spectrum
- Objective
 - To estimate an empirical trade model that illustrates the role of income in trade of processed agri-food products.

Empirical Model

$$\ln imp_{ij}^k = \alpha + \mu_i + \mu_j + \gamma_1 \ln dist_{ij} + \gamma_2 DCB_{ij} + \gamma_3 DPTA_{ij} + \gamma_4 \ln I_i + \gamma_5 \ln \theta_i + \gamma_6 DCG_k + \gamma_7 DED_i + \varepsilon_{ij}^k$$

imp_{ij}^k is real value of imports of country i from country j for commodities belong to sector k;

α represents intercept and μ_i and μ_j represent importer and exporter fixed effects;

$dist_{ij}$ represents distance in kilometers between the bilateral trade partners;

DCB_{ij} is dummy, equal to one if bilateral partners share a common border and zero otherwise;

$DPTA_{ij}$ is dummy for preferential trade agreements between partner countries, equals to one when a PTA exists otherwise 0;

I_i is the real per capita GDP of importing country i (U.S. dollars);

θ_i is the income distribution within importing country represented by Gini index;

DCG_k are eight dummies representing 9 commodity groups (meat, fish, dairy, cereals, vegetables, fruits, sugar and confectionaries, tea, coffee and mates and margarine);

DED_i are 3 dummies representing 4 levels of economic development of importing country i.e. low income, lower middle income, upper middle income and higher income;

\ln represent logarithm; γ represent parameters to be estimated; and

ε_{ij}^k is an error term assumed to randomly distributed with mean zero and variance σ^2

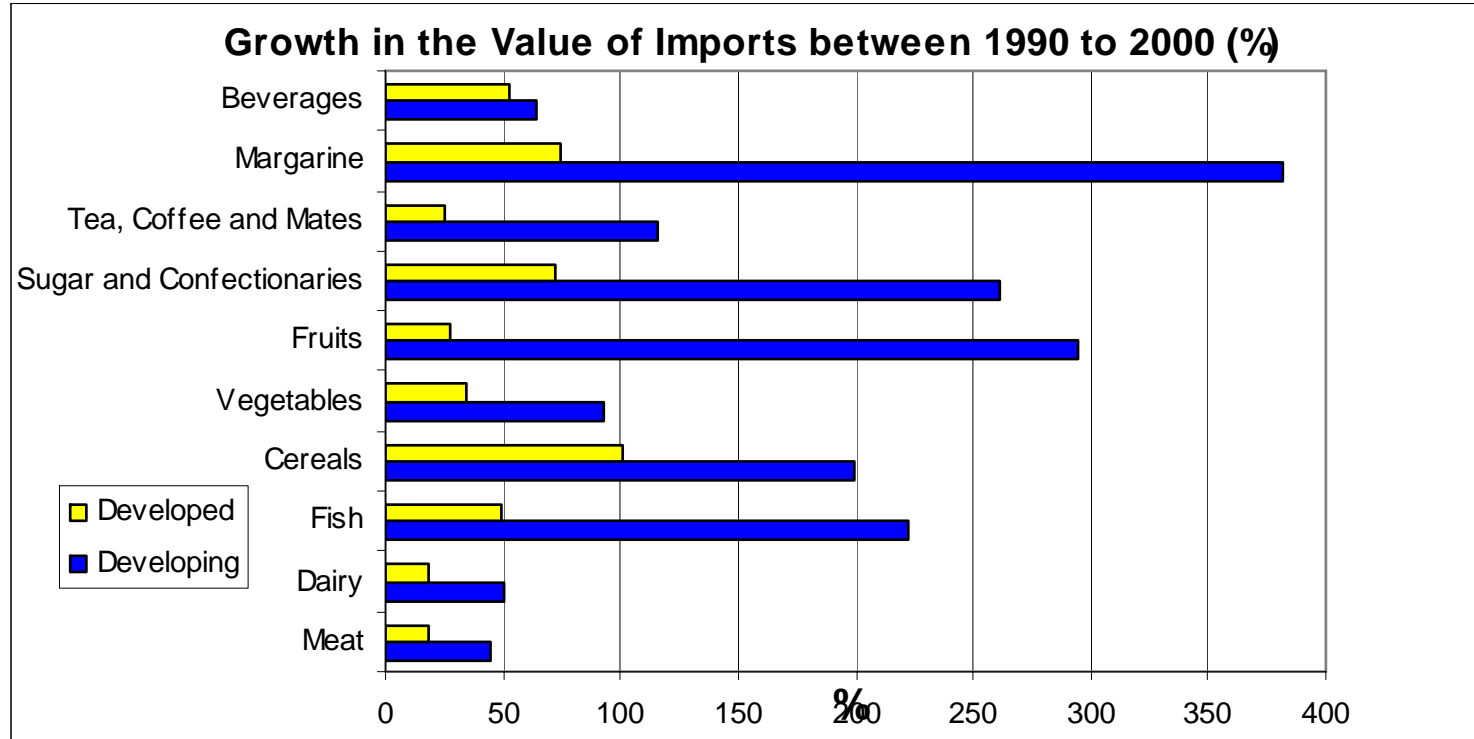
Estimation Issues

- The Problem of Zeros (51% of Obs.)
 - Drop zeros, replace with small numbers, Tobit model
 - Specification Bias
- Heckman Selection Method
 - Two Step
 - Step-1: Selection Equation (Probit model)
 - Commodity Specific model
 - Step-2: Outcome Equation (OLS regression)
 - IMR

Data

- Data
 - 52 Countries (6 LI, 18 LMI, 12 UMI, 15 HI)
 - 50 commodities (Nine commodity groups)
 - 10 years (1990-2000)
 - 5,52,389 observations
 - SITC Rev. 3 at 4 digit level
 - World Trade Analyzer of Statistics Canada

Preliminary Results



Preliminary Results

- Heckman Selection method
 - Likelihood ratio test statistically accept Heckit
- PCI is statistically sig. and +ve
 - Imports increase sig. as income grows
- PCI is statistically different than 1
 - Import growth outpaces growth in income for cereals, fish and margarine
 - Income growth outpaces growth in import demand for meat, dairy, veg., fruits & tea products
 - Preferences are not homothetic

Preliminary Results

- Is the growth in import demand the same across the development spectrum?
 - Import growth for developing countries is higher than developed countries
- South-South, North-North and North-South Trade
 - Irrespective of dev. level, income is statistically different than one
 - Higher exp. elasticities were found for developing countries importing from developed countries

Conclusions

- Income plays an important role in agrifood trade
- Expenditure elasticities are not equal to 1
 - Preferences are overwhelmingly non-homothetic for agrifood products
- Developing countries are important
 - Growth in import demand outpaces growth in income



Thanks

Discussion