



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

# **How China's Palm Oil Imports Impact Its Soybean Oil Imports**

**Wei Chen**

School of Public Economics and Administration  
Shanghai University of Finance and Economics, [chenw@vt.edu](mailto:chenw@vt.edu)

**Andrew Muhammad**

Economics Research Service (ERS)  
United States Department of Agriculture (USDA), [amuhammad@ers.usda.gov](mailto:amuhammad@ers.usda.gov)

*Poster prepared for presentation at the Agricultural & Applied Economics Association 2010 AAEA, CAES, & WAEA Joint Annual Meeting, Denver, Colorado, July 25-27, 2010*

*Copyright 2010 by Wei Chen and Andrew Muhammad. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that this copyright notice appears on all such copies.*

# How China's Palm Oil Imports Impact Its Soybeans and Soybean Oil Imports

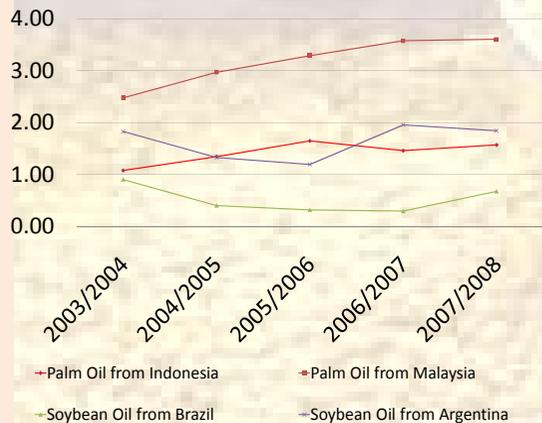
Wei Chen, Shanghai University of Finance and Economics, [chen.wei@mail.shufe.edu.cn](mailto:chen.wei@mail.shufe.edu.cn)

Andrew Muhammad, ERS, USDA, [AMUHAMMAD@ers.usda.gov](mailto:AMUHAMMAD@ers.usda.gov)

## Introduction

- China is the world's largest soybean oil importer.
- Brazil and Argentina dominate China's soybean oil imports.
- Soybean oil is imported to produce edible oil .
- China imports a large quantity of palm oil from Malaysia and Indonesia.
- Palm oil is imported for the food industry (i.e. producing instant noodle) and producing edible oil.

**Figure 1. China's palm oil and soybean oil imports (metric tons , millions)**



Data source: USDA, FAS GAIN Reports , Available on the World Wide Web:  
<http://www.fas.usda.gov/scriptsw/AttacheRep/default.asp>

## Objective

To assess the competitiveness between China's palm oil and soybean oil imports differentiated by exporting country.

## Method

The differential production model is used in estimating China's oil demand (Laitinen and Theil, 1978). Four imports/inputs are considered: soybean oil imported from Brazil and Argentina, palm oil imported from Malaysia and Indonesia.

Let  $x$  denote the import quantity and  $w$  the import price. The oil-import allocation decision for China can be specified as:

$$\bar{f}_z DX_z = \theta_i DX_i + \sum_{j=1}^n \pi_{ij} Dw_{jt} + u_z$$

$f_i = w_i x_i / \Sigma_i (w_i x_i)$  :  $i$ th import share.

$\theta_i = \partial w_i x_i / \partial \Sigma_i (w_i x_i)$  : marginal import share.

$\pi_{ij}$  : conditional price effect.

$u_z$  : random disturbance term.

$DX_z = \sum_{i=1}^n \bar{f}_i DX_i$  : Divisia volume index (change in real aggregate expenditures)

$Dx_n = \log(x_n / x_{n-1})$ ;  $Dw_x = \log(w_x / w_{x-1})$ .

## Model Restrictions

Adding up:  $\sum_i \theta_i = 1$  &  $\sum_i \pi_{ij} = 0$

Homogeneity:  $\sum_j \pi_{ij} = 0$

Symmetry:  $\pi_{ij} = \pi_{ji}$

## Data

China's monthly quantities (million metric tons) and values (million U.S. dollars), soybean oil and palm oil imports, Jan. 05 - Dec. 08

## Estimation Results

### Conditional Expenditure and Price Elasticities

Exporter /Product	Expenditure	Price			
		Soy. Oil Brazil	Soy. Oil Argentina	Palm Oil Malaysia	Palm Oil Indonesia
Soybean Oil Brazil	0.80751 (0.3613) *	-3.8069 (0.9091)*	2.4437 (1.0593)*	3.5562 (1.0639)*	-2.1930 (0.8886)*
Soybean Oil Argentina	1.6743 (0.2534) *	0.5985 (0.2594)	-0.0011 (0.5960)	-0.6755 (0.4896)	0.0780 (0.4314)
Palm Oil Malaysia	0.7184 (0.1178) *	0.4921 (0.1472)*	-0.3816 (0.2766)	-1.5147 (0.5152)*	1.4043 (0.4508)*
Palm Oil Indonesia	0.8349 (0.1783)*	-0.6890 (0.2792) *	0.1001 (0.5533)	3.1882 (1.0234)*	-2.5993 (0.9684)*

\* Denotes significance at the 5% level.

## Findings

China's total expenditures have a positive effect on all oil imports particularly for Argentina.

Imports from Brazil and Indonesia are highly elastic.

Soybean oil from Brazil and palm oil from Malaysia are substitutes.

Palm oil from Malaysia and Indonesia are substitutes.

## References

- Laitinen, K. and H. Theil (1978). "Supply and Demand of the Multiproduct Firm." *European Economic Review*, 11: 107-154.
- USDA, FAS GAIN Reports

\*The views expressed are those of the authors and not necessarily those of ERS or USDA.