# The Impact of Globally Fluctuating Food Prices on the Bolivian Price Level

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## Introduction

The food crisis 2007/08 arose concerns how developing countries would be affected by extreme short-term fluctuations in international food/agricultural commodity prices.

This question was analyzed for Bolivia from a macro-economic point of view, with focus on a market integration analysis and an evaluation of the policy interventions on behalf of the new socialist government.

## Research questions

1. Determine the degree of price transmission between the world market and the Bolivian market:

→... for an *import product* (wheat/wheat flour): 60-70 % of the Bolivian wheat consumption is covered by imports [about 95 % of the import quantity comes from Argentina];

→... for an *export product* (oilseed complex): 70-80 % of the Bolivian production of vegetable oils is exported.

2. Relate the results from the price transmission analysis to the policy interventions in Bolivia.

## Methods

Cointegration/error correction modeling techniques were applied to price series data:

1. Augmented Dickey-Fuller test
---> unit root test for stationariy vs. nonstationarity

2. Johansen-Trace Test for cointegration
---> comovement between I (1) series?

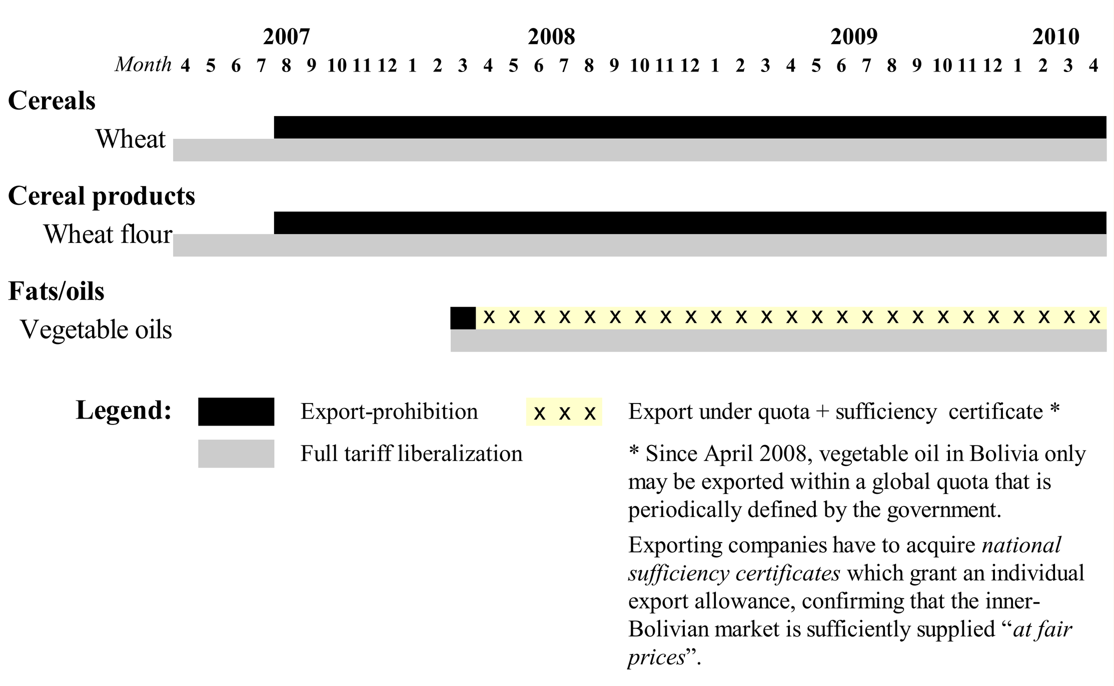
3. Specification of vector error correction model (VECM)
---> long-run relationship between price series?

4. Granger-causality Test
---> direction of price transmission?

## Background policy interventions

During and after the period of the food crisis 2007/08, the new socialist Bolivian government has applied the following...

...*trade-oriented measures*:




... *consumer- and producer-oriented* measures:

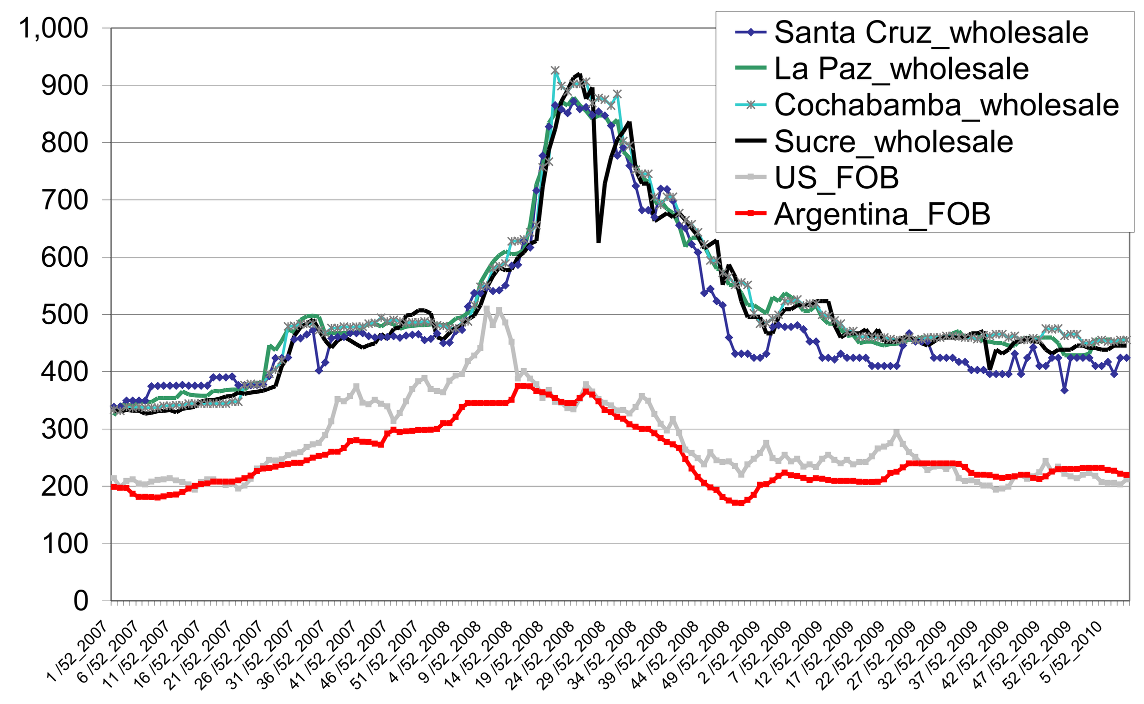
• state-imports and sales at subsidized prices to wholesalers, processors and final consumers (e.g. wheat flour and wheat products),

• governmental intervention purchases and state-subsidized processing and distribution (e.g. vegetable [soy] oil, wheat flour),

• input-subsidies to growers (e.g. wheat).

## Results

Wheat flour Bolivia (from Argentina) / wheat as grain (FOB USA, Argentina) prices 2007-02/2010: in US $ per tonne; T=164; weekly




Source: SIMA/FDTA Valles (2010), FAO/International Grains Council (2010), DIMEAGRO (2010), own calculations.

**Price transmission analysis *wheat (flour)*:**

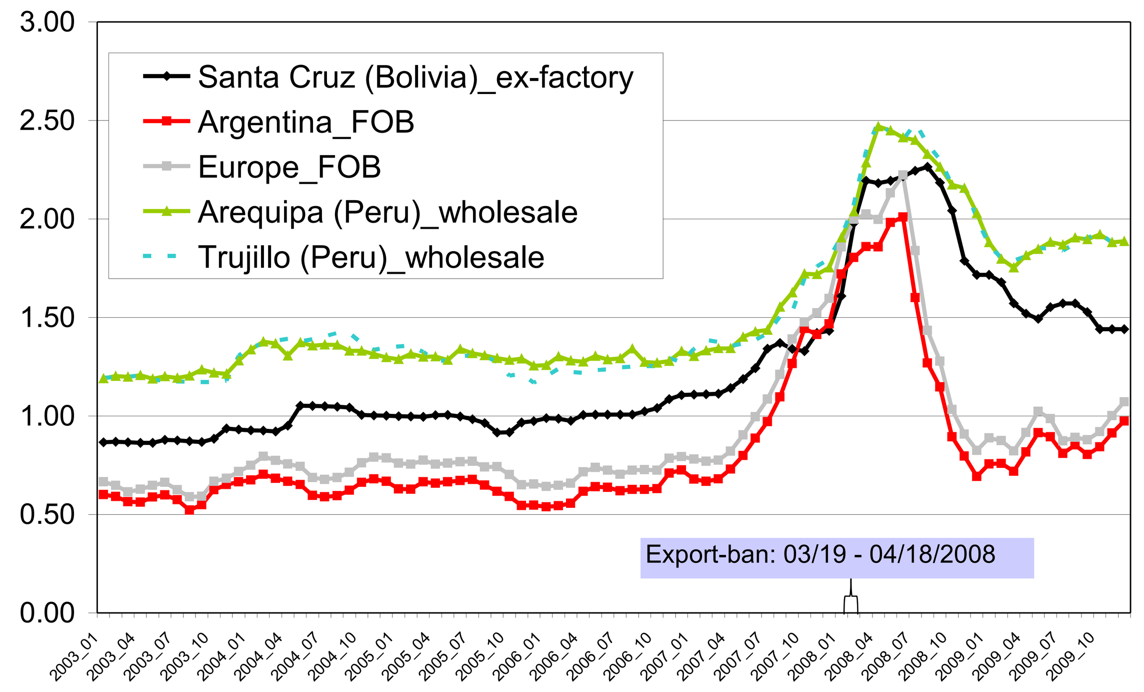
• Cointegration between all Bolivian wholesale price series for wheat flour (from Argentina) and the Argentinean export price for wheat as grain (≤ 5 % significance level).

• No comovement with the US export price for wheat as grain, except for the town of La Paz.

• VECM yields long-run price transmission elasticities $\beta^{B}$ from the Argentinean to the Bolivian market: for Sucre (1.103), Santa Cruz (1.123), La Paz (1.199) and Cochabamba (1.248).

• The larger the road distance of the wholesale market to the Argentinean border, the larger $\beta^{B}$.

Sunflower oil prices 2003-2009: in US $ per liter; T=84; monthly




Source: CAO (2010), ISTA Mielke GmbH (2010), SISAP (2010) own calculations.

**Price transmission analysis *sunflower oil*:**

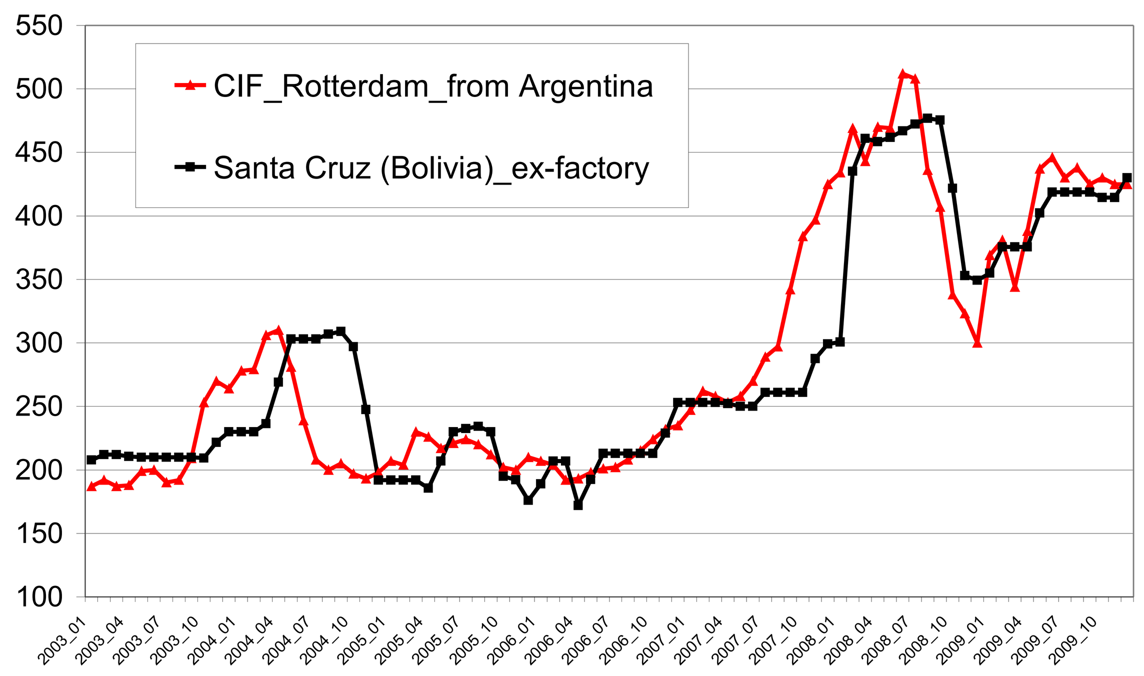
• Cointegration with the ex-factory price for bottled, refined sun oil from Santa Cruz (Bolivia) only in case of the Argentinean FOB price for crude sun oil (at the 1 % level).

• For the cointegrated Bolivian and Argentinean price series, the corresponding VECM yields a long-run price transmission elasticity $\beta^{B}$ of 0.949.

• The null of perfect market integration is not rejected.

• Granger-causality testing suggests: price transmission occurs from the Argentinean to the Bolivian market.

Soy extraction cake (Santa Cruz) / soy pellets (Argentina CIF Rotterdam) prices 2003-2009: in US $ per tonne; T=84; monthly




Source: CAO (2010), ISTA Mielke GmbH (2010).

**Price transmission analysis *soy extraction cake*:**

• Price series are cointegrated at the 1 % level.

• The VECM gives a long-run price transmission elasticity $\beta^{B}$ of 0.949.

• The null of perfect market integration is not rejected.

• Granger-causality testing indicates that price transmission occurs from the Argentinean to the Bolivian market.

## Conclusions

• The global food price boom 2007/08 reached the Bolivian price level for *wheat flour* and *products from the oilseed complex.*

• Their price dynamics at the Bolivian market are strongly influenced by the dynamics at the Argentinean export market.

• The temporary export-ban on edible oils from March/April 2008 is a questionable trade intervention, considering...
a) ...the complete price transmission in case of sun oil (no price spikes due to speculation),
b) ...the low share of the national production consumed domestically (20-30 %).

• Interventions at the Bolivian market for wheat/wheat flour did not...
a) ...prevent the full transmission of price shocks from the Argentinean export market for wheat.
b) ...benefit those consumers of wheat flour who could not access to subsidized bread.

• Wholesale markets for wheat flour with larger spatial distance to the Argentinean border were worse off in case of positive price shocks at the Argentinean market.

-->Commercial importers may have the possibility of increasing mark-ups over-proportionally, the larger the border-distance.

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