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**Research Report**

## Food Price Volatility in Landlocked Developing Countries

FERDI Policy Brief, No. B139

**Provided in Cooperation with:**

Fondation pour les études et recherches sur le développement international (FERDI),  
Clermont-Ferrand

*Suggested Citation:* Greb, Friederike; Rapsomanikis, George (2015) : Food Price Volatility in Landlocked Developing Countries, FERDI Policy Brief, No. B139, Fondation pour les études et recherches sur le développement international (FERDI), Clermont-Ferrand

This Version is available at:

<https://hdl.handle.net/10419/269741>

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## Food Price Volatility in Landlocked Developing Countries\*

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For a country, geography can be an important determinant of its trade patterns, but also of its economic growth. Landlocked countries often lag behind coastal nations in terms of external trade, growth, and development. Distance from the coast, often poor transport infrastructure, which increases trade costs, and dependence on transit countries hinder integration with the global economy. It costs, on average, twice as much to ship cargo from a landlocked developing country as from one of its coastal neighbours (World Bank, 2008). Limited participation in international trade networks also contains spillovers of technology and hinders competition, both of which can shape growth in the longer run. Together with low development levels landlocked countries experience low life expectancy and educational attainments, and deficient institutional and policy frameworks (Fat et al., 2004; Carmigliani, 2012).

\* Paper prepared for the Ferdi workshop on "Commodity market instability and asymmetries in developing countries: Development impacts and policies", held in Clermont Ferrand, France, June 24-25, 2015.

•••/••• The Almaty Programme of Action, adopted in 2003, recognized the special needs of landlocked developing countries by establishing a new global framework for developing efficient transit transport systems, taking into account the interests of both landlocked countries and their partners, who often are transit developing countries.

Landlocked developing countries also face significant challenges in their efforts to achieve food security. Often, agriculture in landlocked countries is characterized by low productivity, inflexible production structures and low skill capacity, making these nations dependent on world food markets, with which they are not well-linked. Lack of trade means that small shocks in the supply of or the demand for food can generate wide movements in prices with significant negative consequences for the poor. Such excessive and persistent food price volatility can have significant effects.

In the short run, for food importing landlocked countries, food price shocks can have serious macroeconomic and microeconomic consequences. They can negatively affect the balance of payments, foreign currency reserves and the ability to implement social safety programs. In the longer run, the diversification of activities to minimize exposure to price risk inhibits efficiency gains from specialization in production and hinders the development of the agricultural sector (Kurosaki and Fafchamps, 2002). Income risks may also blunt the adoption of technologies necessary for agricultural production efficiency, as producers may decide to apply less productive technologies in exchange for greater stability (Larson and Plessman, 2002).

In this article, we analyse food price volatility in markets in both landlocked and coastal countries. Our sample consists of monthly prices in 49 countries and 150 food markets for rice, wheat, maize, millet and sorghum between 1991 and 2014. We use data from the FAO Global Information Early Warning System, as well as other data sets such as WITS and form a panel in order

to explore the factors that determine volatility in these markets. We do this separately for landlocked and coastal countries. Our objective is to inform policy discussions and propose effective measures that can reduce food price volatility in landlocked countries.

To proxy food price volatility, we use the sample standard deviation of logarithmic returns within two year periods. We analyze this variable as a function of food commodity trade as a percent of the GDP and distance to coast. We also include agricultural value added productivity per capita and food stocks operations. In order to capture the effect of trade with transit and other partner countries on price volatility, through flows and trade agreements, we test a variable that reflects a country's position in the trade network, measured as its eigenvector centrality (Gray and Potter, 2012). This variable positions countries in terms of both the number of nations they trade with and the importance of these within the trade network and, thus, indicates whether they are at the core or the periphery of the trade network. We estimate a mixed model with random effects for markets to account for correlation between observations corresponding to the same market. We maximize the restricted log-likelihood in order to estimate parameters.

We find that food markets in landlocked countries are not more volatile than those of coastal developing countries. This may appear to be counter-intuitive, but the extent to which prices in domestic markets are volatile may be a function of the origin of the shock. In landlocked countries with markets not well integrated with the global market or regional trade networks, global price shocks, such as the surge of 2008, may have little effect, while domestic production shocks can generate wide market price movements.

Our results provide a good basis for discussion on policies that may reduce food price volatility in landlocked countries. Increases in agricultural productivity appear to be more ef-

fective in reducing food price volatility in coastal countries than in landlocked ones. However, such a result should not disqualify policies that increase agricultural productivity as measures to reduce food price volatility. In our sample, most landlocked countries are also low-income and food deficit countries, and the extent of this deficit, relative to coastal countries, may be such that even significant increases in productivity may not have been effective in reducing food price volatility. Encouraging local food production and supply is vital to improving food security and supporting livelihoods.

More trade and a better trade position can reduce volatility. Having more trade partners matters for landlocked countries. It also matters that these partners have a significant trade positions and are well-integrated. This underlines the importance of trade agreements and effective trade partnerships.

For the markets we examine, food stocks appear to have a statistically insignificant effect on food price volatility in coastal countries, but to be crucial in landlocked ones. Stock operations have a significant negative effect on food price volatility. Although food reserves and open market operations are expensive and often ineffective in containing price spikes, there may be a case for their use as a short term price stabilizing instrument in landlocked countries, where trade is also expensive and food imports may take time to arrive.



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n° ISSN : 2275-5055

