PDPE Market Analysis Tool: Import Parity Price

The import parity price (IPP) is the price at the border of a good that is imported, which includes international transport costs and tariffs. If a good is cheaper abroad, i.e. the domestic price is higher than the IPP, traders have a strong incentive to import the good. A comparison of the time series of domestic wholesale prices of the main staple food, import parity prices and import quantities can give an indication whether traders are responsive to price changes. The key question is whether private sector imports take place when domestic prices rise to levels approximating the IPP. If this is the case, the domestic market is integrated with regional or world markets and domestic shortfalls in food supply are likely to be mitigated through imports and the IPP is likely to provide a ceiling for domestic prices.

What insights can this tool provide?

The tool helps to understand whether the national market is integrated into the regional or world markets. If a country is integrated into regional or global food markets and trade is basically free, food supply shortages, which would normally cause rising domestic prices, are likely to be met through private imports if there is domestic purchasing power. As a result, prices will stabilize at import parity.

This could have important implications for decision making, including on food aid needs. Overly pessimistic assessments of import supply responses can lead to overestimates of food aid needs. If too much food aid is distributed, food prices could fall, leading to disincentive effects on traders and possibly on future food production. Conversely, overly optimistic expectations of import quantities will lead to the underestimation of the food gap. On the other hand, announcements on food aid can have an effect on private traders. They have to be transparent and credible.

Furthermore, for procurement purposes, if domestic wholesale prices are above the IPP, food is likely to be scarce on the domestic market and should not be purchased locally.

How to analyse, interpret and use the data

Rising imports, in response to domestic wholesale prices at or slightly above the IPP, indicate that the private sector responds to price incentives and a shortfall in production should be compensated by imports. If, on the other hand, a domestic wholesale price above the import parity level does not lead to an increase in imports, it indicates that markets are not integrated with external markets. This could be explained by weak trader capacity, lack of competition, import/export barriers or government policies affecting imports and exports (see also Limitations of the tool below). Further analysis to understand the specific reasons why imports do not respond to rising prices should be carried out.

For a simple visual examination of whether imports react to a positive price difference between the domestic wholesale price and the import parity price, it is best to plot the three time series in a graph (see below).

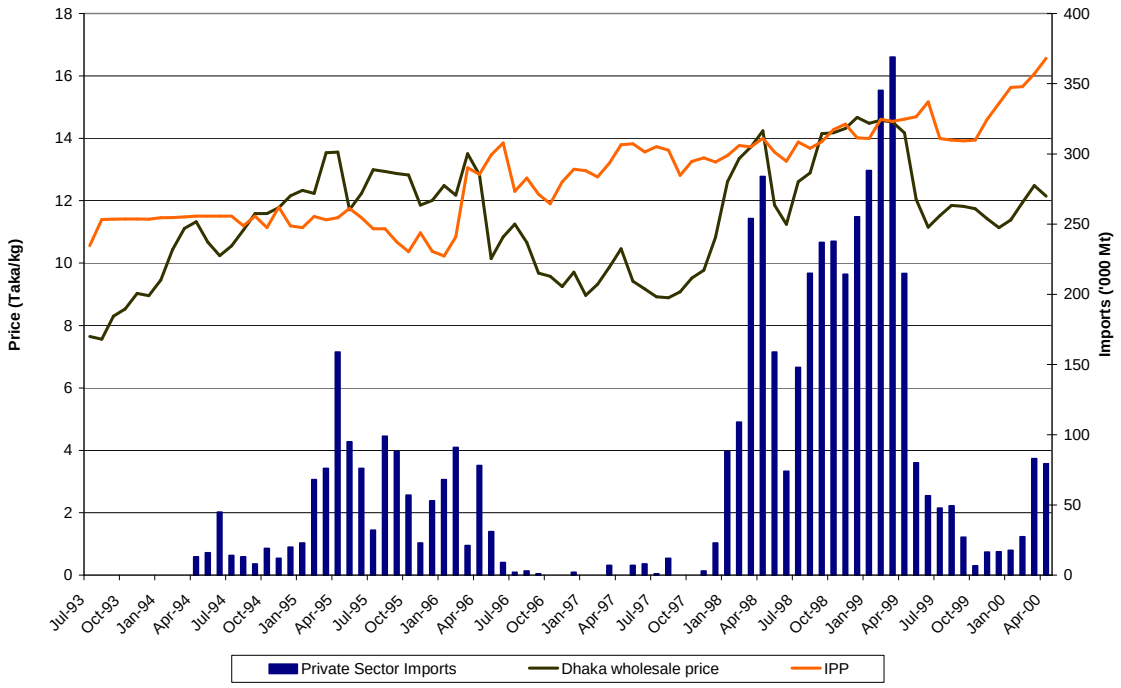
Example: Rice imports after the 1998 Bangladesh flood[1]

Rice flows between India and Bangladesh nearly came to a halt between 1996 and 1997. Favourable weather and stable input supplies helped boost rice production in Bangladesh and domestic market prices dropped below import parity levels. But, following a poor rice harvest in Bangladesh in November/December 1997, rice prices rose sharply and soon reached import parity levels. The Government encouraged private sector food imports and removed a surcharge on rice imports. From December 1997 to May 1998, 917,000 Mt of rice were imported by the private sector.

A good rice harvest in Bangladesh in May 1998 brought a sharp decline in rice imports from India, as prices dropped below import parity. But from July to September 1998, floods in Bangladesh destroyed large quantities of rice crops, leading to a sharp rise in wholesale prices for rice, surpassing import parity.

Government rice policy was based on the realization that government imports and food aid alone would not be sufficient to make up for the projected shortfall in rice supply before the next harvest in April-June 1999. Consequently, the Government of Bangladesh encouraged private sector imports and the private sector responded with importing more than 200,000 Mt of rice per month from August 1998 to March 1999 (see graph below).

Import parity price, wholesale prices and imports in Bangladesh, 1993-2000



Source: Dorosh (2001)

In comparison with private sector rice imports, government interventions in the domestic rice market were small — only 399,000 Mt from July 1998 to April 1999.

[1] The example is based on Dorosh, P. 2001. Trade Liberalization and National Food Security: Rice Trade Between Bangladesh and India. *World Development* 29(4): 673-689.

Private sector rice imports, equal to 2.42 million Mt over the same period, were 6.1 times larger than government distribution.

Limitations of the tool

Domestic wholesale prices may diverge from estimated import parity prices even when trade is taking place or trade may not take place even though domestic wholesale prices are above IPP. Some reasons for this include:

- Trade barriers other than tariffs are in place. In this case, private traders may not be able to import the full quantity of imports that they would in the absence of these trade barriers (i.e. the trade barriers are *binding*) and the market price may be higher than the IPP;
- Large-scale government imports or food aid reduces the domestic price below import parity prices;
- Export or production subsidies could artificially reduce the IPP, bringing domestic wholesale prices above IPP without indicating that food is relatively scarce;
- If competition on the domestic wholesale market or among importers is limited, traders may decide to import less than what would be imported in a competitive market to get higher prices. Again, the domestic wholesale price will be higher than the calculated import parity price;
- Traders are uncertain about government policies related to future import tariffs and restrictions, levels of government commercial imports and how much food aid (and grain from government stocks) the government or other agencies are planning to distribute. This creates uncertainty about potential profits for traders and could prevent traders from reacting to price incentives;
- The actual exchange rate used by agents might be a black market exchange rate and not the official rate. In this case, it would be useful to re-calculate import parities using this parallel market. Exchange rates could also be very volatile, creating uncertainty for traders;
- Official trade statistics may be unreliable and a significant part of imports may come through informal channels, evading trade monitoring systems ; and
- Internal transport costs can be significant, creating a wedge between the border IPP and the domestic price, which is determined in the wholesale market away from the border (see under refinements).

One other limitation of the tool is that it is not really appropriate for estimating import volumes. Close inspection of the graph could give a rough quantitative idea of the responsiveness in terms of volumes, but the Zambia spreadsheet model (see PDPE tool on Zambia model) is a better tool to estimate import volumes.

How to calculate the indicator

The import parity price is defined as the import price at the border of the importing country in domestic currency. The IPP includes the world price plus international transport costs, insurance and, if applicable, the import

tariff.[2] It could be difficult to get monthly data on transportation costs. As a first approximation, one could assume constant transportation costs.

$$IPP = \left[\left(P_{fob} + Tr\right) * XR\left(1 + T\right)\right]$$

IPP:	Import parity price *(LC/Mt)*
P_{fob} :	World (or cheapest cif import) market price for rice *(US$/Mt)*
XR:	Exchange rate local currency vs. US$ *(LC/US$)*
LC:	Local currency unit
US$:	US dollar (or currency of source country)
Mt:	Metric ton
fob:	free on board, i.e. price of a good in the country of origin
cif:	cost, insurance and freight, i.e. price of a good in the country of destination (at the border)
T:	ad valorem[3] tariff *(in %)*
Tr:	transport costs, port handling, etc. *(US$/Mt)*

Example: Import parity price for rice at the border of Bangladesh for April 2000 (see Dorosh, 2001):

P_{Delhi} = 10.03 Rs/Kg
XR = 1.172 Tk/Rs
Tr1 = 1.30 Rs/Kg (transport from New Delhi to border)
Tr2 = 1.10 Tk/Kg (transport from border to Dhaka)
Tr3 = 1.53 Tk/Kg (transaction costs from border to Dhaka)
T = 5% (tax)

$$IPP_{border} = \left[\left(10.03\,\frac{Rs}{Kg} + 1.30\,\frac{Rs}{Kg}\right)\left(1.172\,\frac{Tk}{Rs}\right)\right] * [1 + 0.05] = 13.94\,\frac{Tk}{Kg}$$

Possible refinements:

i) Imports might not respond instantaneously to a widening gap between domestic wholesale prices and IPP. The graph might therefore show a clearer picture if the import series is lagged against the price series.
ii) If imports arrive discontinuously, e.g. because they arrive by ship, and if in one month by coincidence 3 ships arrive, imports are huge and bias the analysis. In that case, it might be better to use 3-month averages.
iii) The assumption that transportation costs are constant could be weakened. Volumes and fuel prices are two important determinants of transportation costs. If fuel prices change significantly, transportation costs could be

[2] The IPP proposed here is different from the one that is used for procurement purposes, which should exclude tariffs (if food aid is exempt) and is calculated in US$. Procurement is interested in actual purchases for food aid. The IPP in this tool is about the incentive (in local currencies) to the private sector for commercial food imports, which would include payments of tariffs, etc.

[3] Ad valorem tariffs are tariffs as a percentage of the value of a good rather than as a fixed amount. Tariffs charged as an amount per weight or volume could also be incorporated.

inflated by the increase in fuel prices. Transportation costs could also be adjusted by the volume of imports.

iv) Internal transportation costs could be taken into account. Dorosh (2001) calculates the import parity price for Dhaka, rather than the border, to compare it with the wholesale price in Dhaka. He adds the transportation costs, marketing costs and margins to the IPP at the border.[4] Dorosh assumed that these costs were constant, except for a one-off jump in transportation costs in November 1998. For April 2000 the calculation is as follows (see also graph above):

$$IPP_{Dhaka} = 13.94 + 1.10 + 1.53 = 16.57 \frac{Tk}{Kg}$$

Data needs, data sources

Import parity price

Data needs	Data source
P_{fob}: Time series (monthly) of prices of potential sources of supply for the major staple food or of world market prices	Local procurement unit, (procurement website, URL : http://docustore.wfp.org/stellent/groups/public/documents/reports/wfp118156.doc) Commodity exchange, like SAFEX in South Africa
Tr: Transportation costs (if possible monthly)	Local procurement/logistics unit, ODTP-I
T: Ad valorem tariffs or ad valorem equivalents of other tariff-like restrictions levied on imports	Trade Ministry
XR: Time series (monthly average) of the exchange rate local currency/US$ or local currency/currency of source country	IMF/International Financial Statistics, National central bank statistics, URL: depends on country

Wholesale prices

Data needs	Data source
Time series (monthly) of domestic wholesale prices for the major staple food	Local procurement unit, procurement website

Imports

Data needs	Data source
Time series (monthly) of import quantities for the major staple food	Trade Ministry, national trade statistics

[PDPE, 20iii2007]

[4]. This includes all in country expenses in the marketing chain up to the wholesaler (import licenses, duties, clearing expenses, loading/unloading, storage charges, transportation costs, etc.).