

SPECIAL FEATURES

FAO'S FOOD PRICE INDEX REVISITED

Introduction

The FAO Food Price Index (FFPI) was introduced in 1996 as a public good to help in monitoring developments in the global agricultural commodity markets. The only major modification made to it – until now – was in 2009, when its base period was updated to 2002–2004. During the significant price hikes in 2008, the FFPI gained prominence as an indicator of potential food security concerns for vulnerable developing countries. Since then, with the exception of 2009 and 2010, prices of agricultural commodities have remained at relatively high levels compared with those prior to 2008.

In order to determine whether there was a need to revise the base period again to reflect changes in trading patterns post 2007, the FFPI was recalculated based on different reference years. This provided an opportunity to review commodity coverage and price quotations. It also allowed to make comparisons with other price indices that may have more desirable properties than the Laspeyres form of the FFPI and to assess the relevance of the index as a possible indicator for food security concerns.

Updating the FFPI

The commodity coverage of the new index has not been changed significantly. In the cereals sub-index, the original FFPI wheat index has been replaced by a new index introduced by IGC.¹ In the meat sub-index, two of the existing quotations have been replaced by new series that can be updated every month. The casein prices were dropped from the dairy sub-index because of lack of reliable data, but the geographic coverage of the index has been extended by adding new quotations to butter, whole milk powder and skimmed milk powder.² Finally, fish oil and tallow prices were dropped from the oils sub-index, partly due to lack of data and partly to make this group consistent by including only the prices of vegetable oils.

New FFPI: 23 commodities, 73 price series

Under the new approach, the index includes the following 23 commodities: wheat (10 price quotations monitored and reported by the IGC), maize (1 quotation) and rice

(16 quotations) for cereals; butter, whole milk powder, skimmed milk powder (2 quotations for each) and cheese (1 quotation) for the dairy group; poultry (13 quotations), pig (6 quotations), bovine (7 quotations) and ovine (1 quotation) for the meat group; sugar (1 quotation); the oils group consists of one oil price quotation for soybean, sunflower, rapeseed, groundnut, cotton seed, copra, palm kernel, palm, linseed and castor. This construction, thus, includes the use of 73 price series.

For the FFPI currently in use, the base period is 2002–2004. The weights correspond to the share of the export value of each agricultural commodity in the total export value of the 23 commodities included in the index, averaged over these three years. Since agricultural commodity prices have significantly increased since 2008 and have remained higher than during the years prior to 2008, an exercise was undertaken to see whether the FFPI is significantly affected when the base period for determining the weights is changed. The selection of the base period is limited by the availability of FAOSTAT trade data, which covers the years up to and including 2011. With agricultural prices in 2009 and 2010 being lower than the other years during the post-2007 period, three different bases were chosen in order to assess their impact on the FFPI: 2008–2010, 2009–2010 and 2009–2011.

These three indices are graphed together in the lower part of Chart 1 and show that there are level differences between them, but their movements through time follow each other very closely. In fact, the correlation coefficients between them are not less than 0.9999. The values of the “old” FFPI are well above the others, because the prices during 2002–2004 are much lower than those after 2007. However, the correlation coefficients between the “old” FFPI and the others are above 0.999, indicating that the global export trade shares have not altered a great deal since 2002–2004. Therefore, since the FFPI is usually used to assess global developments of agricultural commodities through time, the change of the base period was deferred to a future period.

Weights in 2002–2004 were applied to the relative prices of the individual commodities, rather than the prices themselves as the FFPI used in the previous issues. The denominator or the base price was calculated as the average of the prices prevailing during the base period. Therefore, the values of the “old” and “new” FFPI will be different because of the differences not only in the commodity coverage but also in the way prices are treated in the calculations³. The two series are graphed in Chart 2 for comparison.

¹ A new quotation was added, increasing the number to 10 and the index was rebased to January 2000. (<http://www.igc.int/en/grainsupdate/igcgoi.aspx> for details). The series was extended back to 1990 in this exercise by splicing the “old” index to the “new” index.

² The three new quotations correspond to export prices from European ports for these commodities.

³ There are also slight differences in the export shares of the commodities and, thus, of commodity sub-indices, because the data in FAOSTAT get updated on a continuous basis.

In addition to using different base periods in the construction of the indices, different formulae of price indices with more desirable properties than that of the Laspeyres price index were calculated for comparison. Geometric Laspeyres, Paasche, Fisher and Törnqvist–Theil indices were used for this purpose. The last three indices address some of the shortcomings of the Laspeyres index by taking into account current trading patterns, while the last two are also known as “ideal” or “superlative” indices that make equal use of the prices and quantities in both of the periods compared, and treat them in a symmetric manner.⁴

The three indices are presented along with the FFPI in Chart 3. As can be seen, the differences among the four are not significant. Because the three indices with current weights cannot be calculated for the latest two years, the Laspeyres index remained the preferred one for monitoring and assessing the most recent agricultural market developments at the global level. Moreover, one advantage of the Laspeyres index is that it yields *consistent* results when aggregating to reach annual values through averaging either the monthly indices or the monthly prices. The same results are obtained whether the index is calculated as an average of the individual prices or as an average of the sub-indices of the five commodity groups.

Extending the annual FFPI back to 1961

In order to facilitate the assessment of long-term price/market developments, the annual FFPI was extended back to 1961. For this purpose, the export unit values of the 23 commodities included in the index were treated in exactly the same way as the monitored prices were treated in FFPI: the same base periods and weights were used and then the resulting “unit value” index was spliced to the FFPI for the years 1961 through 1989. Chart 4 contains both series for the period 1990–2011 and shows their closeness to each other. The correlation coefficient between them is 0.99. This is a confirmation that the agricultural commodity prices monitored by FAO to assess global market developments do capture closely the movements of the “actual unit values” of agricultural commodity exports derived from trade data.

The extended series of the FFPI was deflated by the World Bank’s new manufactures unit value (MUV) index,

⁴ See ILO, Consumer Price Index Manual. Theory and Practice, Geneva 2004 for the most comprehensive theoretical assessment of different price indices, comparing their advantages. **An expanded version of this note explaining how these indices have been calculated and summarizing their advantages can be accessed through the following link** (http://www.fao.org/fileadmin/templates/worldfood/Reports_and_docs/FO-Expanded-SF.pdf).

in order to obtain an estimate of real agricultural prices. There are of course other deflators that can be used for this purpose, such as global implicit GDP deflator or global CPI. However, these also include the prices of the agricultural commodities that they are supposed to deflate. The MUV “is a composite index of prices for manufactured exports from the fifteen major developed and emerging economies to low- and middle-income economies,”⁵ and, therefore,

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may be considered a “proxy” representing the rate of exchange between agricultural commodities and manufactured products, especially relevant for developing countries. Regardless, FAO would welcome other suggestions that could result in more “appropriate” real prices.

The two series are displayed in Chart 5. One interesting observation to note in passing is that over at least the past half-century, the only period where real agricultural prices seem to have declined significantly is between the years 1974 and 1987 – a topic that is worthy of further analysis in order to discover the underlying causes.

A global food price index with a focus on vulnerable developing countries

As already noted, FFPI is not an indicator that can be used on its own to assess the food security impact of food prices on food insecure households in vulnerable developing countries. First, the global export shares of the agricultural commodities may not necessarily reflect the structure of the agricultural imports of the developing countries or of household consumption. Second, the international commodity prices used for each agricultural commodity may not represent the unit cost of what the developing countries actually import. And, finally, the actual prices paid by the households may be quite different from the border prices, as their transmission to the local domestic markets could be influenced by many other factors, including changes in exchange rates or trade policies.

In order to determine the extent to which the FFPI is altered when the monitored relative prices are weighted by the value shares of the commodities imported by the food deficit developing countries (FDDCs), another index was calculated. The results, presented in Chart 6, show that prior to 2007, the FFPI is usually above the index where the monitored prices are weighted by the import shares of the

⁵ <http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTDECPROSPECTS/0,,contentMDK:20587651~menuPK:5962952~pagePK:64165401~piPK:64165026~theSitePK:476883~isCURL:Y,00.html> for more detailed definition of the index.

FDDCs. This implies that the basket they had consumed during 2002–2004 would have cost them less than was implied by the FFPI. After 2007, however, their basket would have cost more than that of the basket represented by the export value shares.

However, the significant increases in prices in 2008 may well have led these countries to change not only the composition of the commodities imported, depending on the ease of substitution between them, but also within each commodity – by selecting cheaper forms of the same, where available (e.g. cheaper cuts of meat or less processed forms of the some of the others). In order to assess this, weighted⁶ arithmetic means of the actual export prices monitored by FAO and of the import unit values (IUVs) of the imports of these commodities by FDDCs were calculated. The results, presented in Chart 7, are surprising in that, not only do the two averages track each other very closely (with the correlation coefficient between them equalling 0.96), but also up to 2004 the mean of the IUVs are above the mean of the export prices, on average by more than 6 percent. From 2004 onwards, however, the position of the two are reversed, with one exception in 2009 when the mean IUV was below that of the export prices. The latter suggests that such large increases in prices may have forced vulnerable countries to change the product composition within the commodities that they imported.

⁶ The weights used are the three-year averages of the import shares of each of the 23 agricultural commodities for the food deficit developing countries.

This finding tends to support the discovery above, that had the FDDCs imported the same basket as the one that the export prices monitored, that bundle would have cost more than the basket represented by the export shares at the global level. Thus the FDDCs seem to have altered the pattern of their imports in the face of rapid increases in prices, resulting in their average import unit costs falling below the average of the export prices of agricultural commodities monitored by FAO.

So what is new with the “new” FFPI?

The analysis presented in this Special Feature was designed to discover whether the changes in the global agricultural commodity markets and the improvements in information technology required any revision to the FFPI. Some changes were made to the commodity coverage and to the manner in which the agricultural commodity prices were used in the calculation of the index, but the base period and the form of the index were maintained. The changes introduced, moreover, did not significantly alter the values of the series. The FFPI was extended back to 1961 to allow long-term evaluation of market developments, and a new price index was created to allow determining the possible impact of global price changes on vulnerable developing countries, keeping in mind that far more is needed than monitoring price changes at the global level to assess the impact of such changes on the food security of food insecure households.

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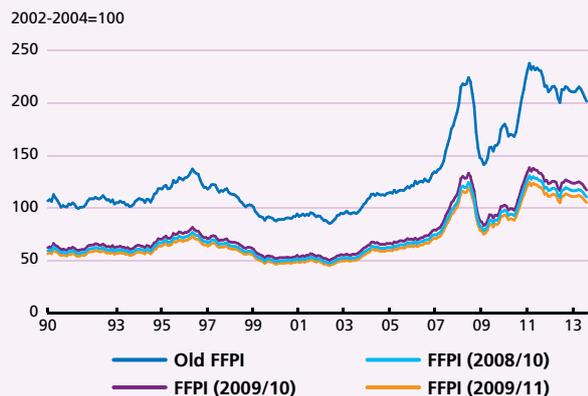
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SPECIAL ACKNOWLEDGEMENT

The FAO Food Outlook team wishes to convey special thanks to Ali Arslan Gurkan who agreed to carry out this analysis and to report on the findings. Ali led the Basic Foodstuffs unit of FAO for several years before retiring in 2008. During his tenure at FAO he launched many important initiatives, including the establishment of the FAO Food Price Index, which is recognized as a leading benchmark for assessing trends in world food prices. We are grateful for his continued support and interest in the work of the team.



Old FFPI compared with new FFPI with different base periods



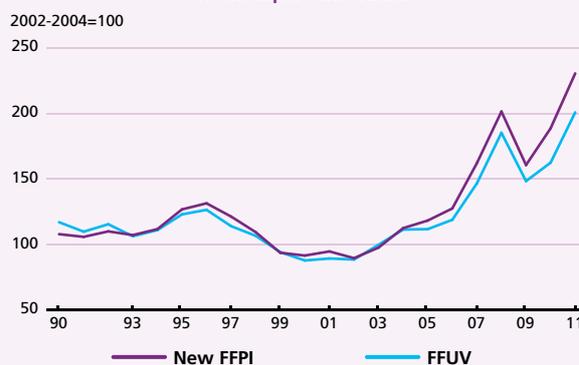
New FFPI compared with old FFPI



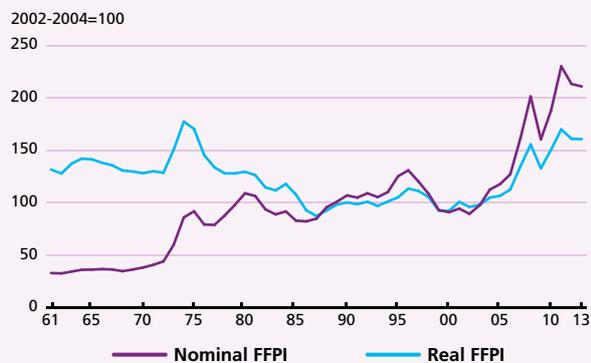
Laspeyres, Paasch, Fischer and Tornqvist price indices using updated data



Annual values of the new FFPI and the Laspeyres index of the export unit values



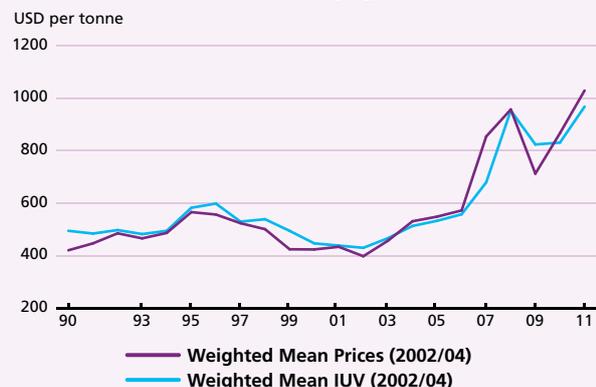
Extended and revised FFPI in nominal and real terms



Comparing FFPI with index using monitored relative prices and import value weights of food deficit developing countries



Comparing arithmetic means of monitored export prices and import unit values of agricultural commodities of food deficit developing countries



G-33 PROPOSAL: EARLY AGREEMENT ON ELEMENTS OF THE DRAFT DOHA ACCORD TO ADDRESS FOOD SECURITY¹

In November 2012, a group of developing countries known as the G-33² tabled an informal proposal at the World Trade Organization (WTO),³ seeking additional flexibility in the global trade body's rules on agriculture. The WTO membership is currently negotiating a draft accord in this area that is to be fast-tracked as the possible centrepiece of a small package of measures for agreement at the Ninth WTO Ministerial Conference in Bali, Indonesia, in December 2013, as a down payment towards a broader deal on the long-running Doha talks on trade. A number of developing countries have argued that progress on agricultural trade issues is needed in order to balance concessions on an eventual deal on trade facilitation – one that will ease restrictions and red tape at customs, and make it easier for goods and services to cross international borders. According to the G-33, focusing on one of the elements of importance to developing countries – namely food security – could help advance negotiations so as to achieve at least some outcomes in agriculture.

The G-33 proposal involved three elements, all of which relate to certain domestic farm support payments. These payments, known as “green box” subsidies by negotiators, are exempt from any cuts or ceiling under WTO rules, on the basis that they cause no more than minimal trade distortion.⁴ Two proposed changes would ease current requirements on domestic food aid and food stockholding programmes, by allowing food purchased at administered prices (above prevailing domestic market prices) from

low-income or resource-poor producers to be exempt from countries' maximum permitted ceiling on trade-distorting support at the WTO.⁵ The third proposed classifying a range of schemes primarily used by developing countries – such as farmer settlement, land reform and other programmes to promote rural development and poverty alleviation – as green box payments under a new clause.

The proponents argue for the proposed changes to the text primarily on the basis of allowing countries to implement support policies consistent with their objectives of improving the food security status of their citizens. Appropriately designed public food purchasing programmes can indeed help to increase the incomes of poor farmers if they gain access to a guaranteed outlet with a higher and more predictable price than achievable on the open market. Greater revenues that accrue to farmers who benefit from better prices can encourage on-farm investment and improvements in productive practices, which could in turn lead to still greater production. Moreover, if procurement schemes are associated with the distribution of food aid, they are likely to reduce expenditures on food by poor consumers. However, the extent to which they achieve these objectives will be determined by the level of national market development and the degree to which producers actually participate in these markets by increasing production that is surplus to their household consumption requirements, in itself determined by a complex set of household specific characteristics.

As such, while subsidized government procurement schemes can help to lift producers out of poverty, they do not guarantee a boost in small farmers' production or an increase in their incomes. Not all farmers are commercially oriented and able to respond to the opportunity provided by more stable, guaranteed markets. In reality, low-income resource-poor farmers are highly heterogeneous in their participation in markets. Whether or not farmers will be willing and able to increase their sales in response to a government procurement programme depends on a range of factors, including the complex production and consumption patterns of rural households. By definition, most low-income, resource-poor producers are semi-subsistence and many in fact are net food buyers.

An important consideration in determining the impact of food procurement schemes is therefore the extent to which they affect prices in the markets from which rural households purchase food to cover their household deficits. While procurement for food aid could be expected to result

¹ For the full version of this note see Christophe Bellman, Jonathan Hepburn, Ekaterina Krivonos and Jamie Morrison (2013) http://www.fao.org/fileadmin/templates/est/PUBLICATIONS/g33-proposal-early-agreement-on-elements-of-the-draft-doha-accord-to-address-food-security_1_.pdf

² G-33 is a coalition of developing countries with large populations of smallholder farmers and includes 46 members: Antigua & Barbuda, Barbados, Belize, Benin, Bolivia, Botswana, Côte d'Ivoire, China, Congo, Cuba, Dominica, Dominican Republic, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, India, Indonesia, Jamaica, Kenya, Republic of Korea, Madagascar, Mauritius, Mongolia, Mozambique, Nicaragua, Nigeria, Pakistan, Panama, Peru, Philippines, Saint Kitts & Nevis, Saint Lucia, Saint Vincent & the Grenadines, Senegal, Sri Lanka, Suriname, Tanzania, Trinidad & Tobago, Turkey, Uganda, Venezuela, Zambia, Zimbabwe.

³ JOB/AG/22, 13 November 2012. See also See “Developing Countries Table Food Security Proposal at WTO”, Bridges Weekly Trade News Digest, Vol. 16, No. 39, 14 November 2012. <http://ictsd.org/i/news/bridgesweekly/149960/>

⁴ The WTO's rules on 'green box' subsidies are set out in Annex 2 of the Agreement on Agriculture: http://www.wto.org/english/docs_e/legal_e/14-ag_02_e.htm#ann1

⁵ The aggregate measure of support (AMS) which countries have agreed at the global trade body not to exceed.

in reduced or “subsidized” prices in locations into which this food is released, these prices might not transmit fully to all rural consumers. Procurement for stockholding without provision for release as food aid could, by contrast, result in upward pressure on local prices.

For those farmers who predominately sell their output in markets, factors affecting their ability to increase supplies in response to government purchasing programmes (essentially, their ability to increase production) may depend on their resource base, risk factors faced, access to technology and financing, and their location in relation to public procurement points, among others. Given their different characteristics and constraints, farmers differ significantly in how they participate in markets and the type of market in which they are most likely to participate, all of which affect the benefits they can derive from state purchasing schemes.

Food stockpiling programmes can also affect trade flows as well as the producers and consumers in other countries, including the most vulnerable among them. Whether or not there is an impact on trade would depend on the magnitude of the operation and, hence, the price distortion that is created by the public procurement programme. One possible effect could be a reduction in exports of the food staples of which the country is a net exporter, since the price subsidy provided could create an incentive to divert some of the production that would otherwise be destined for export to the government procurement programme. Conversely, the inflow of imported staple foods from other countries could be reduced if an increasingly large share of consumption is covered by products entering markets through the government food distribution programmes. The release of stocks can also have important implications. The scale and timing of release, especially if unpredictable and not factored into traders’ decision making, can significantly influence price levels and volatility, both domestically, and, if the country is a significant trader, internationally.

There are also other effects to consider. When a government becomes active as a buyer in a market, it could crowd out private traders who are providing marketing services and market infrastructure at a lower cost, and could be more effective in conveying market signals. In addition, the government expenditure on public food purchasing and stock-holding should be considered. The costs of holding stocks, particularly during periods of consecutive average or above average harvests can be fiscally unsustainable, and the potential for food waste where storage systems are inadequate can be significant.

In summary, the implications of public procurement and stockholding for trade flows need to be considered in light of multiple determinants which include the different phases of operation, the timing, predictability and transparency of operational decisions, the structure and functionality of markets from which stock is procured and into which it is sold and, not least, the supply responsiveness of low income resource poor producers.

The G-33 proposal has to be seen in the broader context of the difficulties many countries are facing in adjusting to the challenges of the new agricultural trade policy environment, as well as in the context of the failure to achieve more than minimal progress on the reform of the multilateral trading system since the end of the Uruguay Round, now almost two decades ago. It can also be seen as indicative of a renewed commitment on the part of some of the larger developing countries to ensure that trade rules and trade policies contribute towards progress on long-standing development goals, such as food security. However, this must also consider the risks that the initiative may create for the achievement of these goals in other developing countries, some of which may be unable to muster the same resources for the pursuit of these same public policy objectives.

Experience from countries around the world demonstrates clearly that policy-makers and negotiators will have to examine carefully the specific implications of new rules and mechanisms for markets if they are to be sure that public procurement policies actually deliver improved food security for market actors – not least for smallholder producers and poor consumers. While enhanced flexibilities at the multilateral level could deliver real benefits to low-income, resource-poor farmers, the design of international disciplines on public procurement and domestic food aid could have far-reaching implications for global agricultural markets that need to be given more careful consideration.

In the run-up to the Bali Ministerial Conference, Member Countries are working to agree upon a “peace clause” that will provide assurance to countries at risk of breaching their domestic support commitments that they will not be challenged by trading partners while a more permanent mechanism is being established. At the same time, negotiators could usefully explore the scope for establishing a post-Bali work programme looking at the full range of trade and food security concerns, with a view to improving the ability of the multilateral trading system to respond effectively in this area.

