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# Feeding Asian inflation: Assessing the food price risk

Emerging Markets ● Economics ● Asia

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## Heading for a 2007-08 style crisis?

- **Food inflation on the rise.** Non-Japan Asia's (NJA) food price inflation in November was at its highest level in the past decade, except for 2007-08 when global food prices spiked to extraordinary heights. As such, it is no wonder that food price inflation is among the top concerns on investors' minds.
- **The rise before the fall.** Our central scenario is for NJA food inflation, in year-on-year terms, to rise further from 9.5% in the latest number for November and to peak at around 15% in mid-2011, adding a further 1.5pp to headline inflation for the region. It is worth noting that our nominal GDP-weighted aggregate food inflation numbers are dominated by food price developments in China.
- **Adding pressure to tighten.** Higher food inflation is likely, at the margin, to add to the existing pressure to raise policy rates and/or allow further currency appreciation in NJA. This is particularly true in China and India, in our view, where food inflation is a big issue at present.
- **Another food price crisis in 2011?** Recent flooding in rice exporting economies, the potential commodity price boost stemming indirectly from QE2, and food inflation problems in China have led many investors and analysts to wonder whether the NJA economies are heading towards another food price crisis, similar to the one in 2007-08.
- **It would probably require further adverse weather shocks to drive food commodity prices much above current levels.** The 2007-08 food crisis was initially sparked by the fear of wheat shortages in some countries due to weather shocks and low local stocks. This led some governments to impose export restrictions on rice, the key staple substitute, causing its price to jump. However, the estimated global and exporting countries' stock-to-use ratios of both wheat and rice are considerably higher today than in 2007-08, making shortages and drastic export bans unlikely, in our view.
- **Which countries are most exposed?** Given that additional supply or demand shocks cannot be ruled out altogether, we analyze what would happen to CPI inflation if food commodity prices were to spike by another 30% from here. We estimate CPI inflation in the three most exposed NJA economies – Hong Kong, China, and Indonesia – could increase by 2-3 percentage points by mid-2011. Our regression-based scenario analysis suggests that Malaysia and Korea are the countries in the region that are least exposed to such food price shocks in terms of headline CPI inflation.

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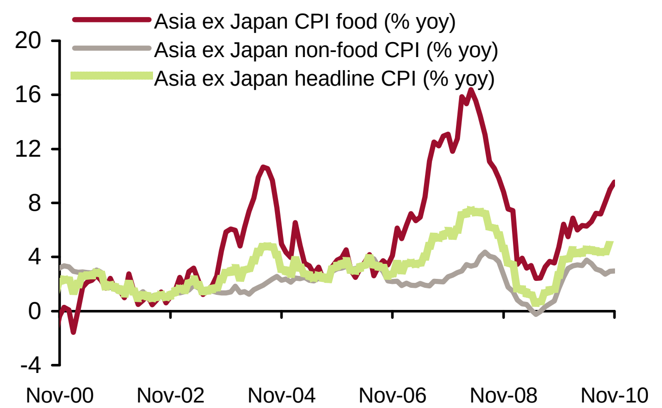
# A repeat of 2007-08 food price crisis?

**Food inflation on the rise again**

CPI inflation in Non-Japan Asia (NJA) has risen in recent months, largely reflecting rising food price inflation (Exhibit 1). On our GDP-weighted measures of aggregate inflation for Asia excluding China and Japan, year-on-year food price inflation in October was the highest recorded in the past ten years, except for 2008 when global food prices spiked to extraordinary heights (Exhibit 2). So are we heading into another food price crisis similar to that of 2007-08, perhaps because of the unusually bad weather conditions in Asia and other parts of the world that raise the risk of significantly lower crop yields?

**Exhibit 1: Inflation was all about food**




Source: CEIC, Credit Suisse

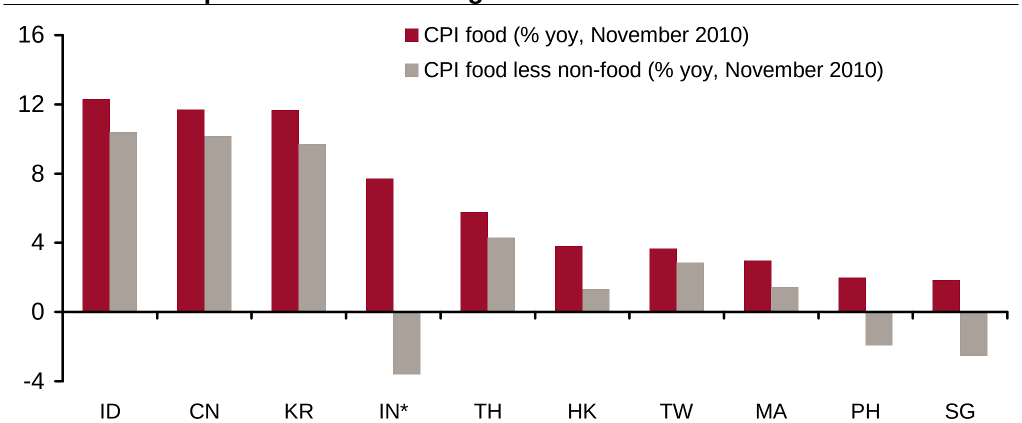
**Exhibit 2: Food inflation had been trending up**


Source: CEIC, Credit Suisse

**Food price inflation is very different across the countries in non-Japan Asia**

Before addressing this question, we take a look at recent food price inflation developments in each of the individual Asian economies to see how widespread the problem is at this stage. Year-on-year food price inflation currently ranges from low single digits in Malaysia, the Philippines, and Singapore to over 10% in China, Indonesia, and Korea. To separate out the effect of food inflation from generalized inflation, we also look at the difference between food and non-food inflation (Exhibit 3). By this measure, China, Indonesia, and Korea seem to have experienced some kind of food price-specific shocks, while in India, the Philippines, and Singapore, food inflation was not as high as non-food inflation.

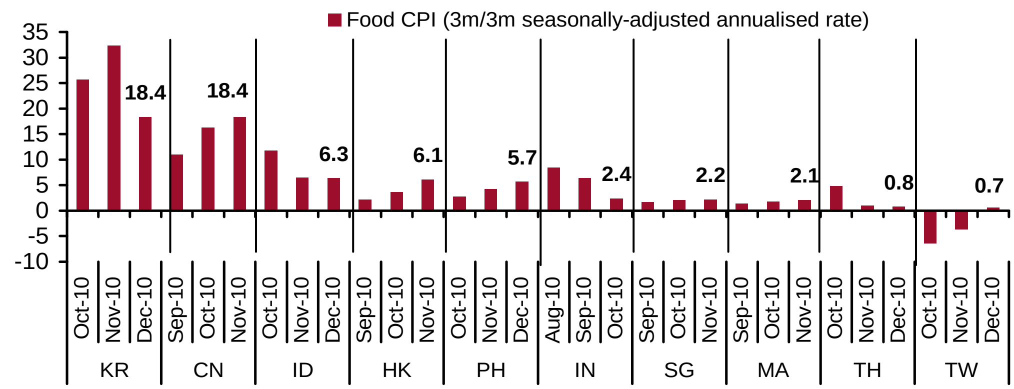
**Exhibit 3: Food price inflation was high in a number of economies**




Source: CEIC, Credit Suisse. *October data.

Korea and China stand out as having had the highest food price momentum in recent months, with food price inflation rising at a double-digit rate on a 3m-on-3m seasonally adjusted annualized basis (Exhibit 4). In Korea, the rise was largely due to the spike in the prices of kimchi (fermented vegetables), and the recent readings in November and December point to a sharp reversal in food prices. However, the outlook for inflation remains worrying in China. Our China economist Dong Tao expects headline CPI inflation to rise above 6% by mid-2011, driven by still higher food prices and strong wage growth. In 2007-08, it is interesting to note that China led food price developments in other Asian countries (Exhibit 2), so what are the chances of history repeating itself?

**Exhibit 4: Food inflation was high in Korea and China**



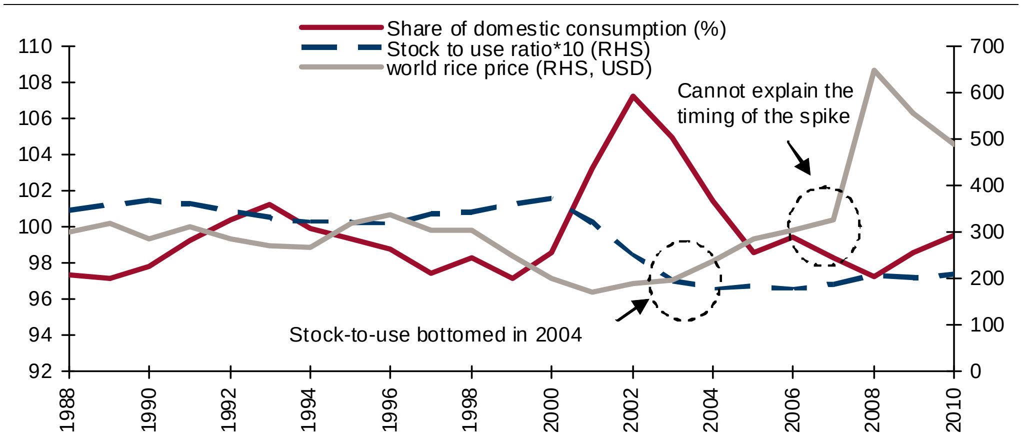

Source: CEIC, Credit Suisse

## The 2007-08 Food Crisis: Panic + Rice = Price

**In 2007-08, low global grain inventories may have contributed to the global grain price spike**

In order to properly consider the risk of a repeat of the 2007-08 crisis, it is first important to understand what caused it. Given that the well-documented 100% jump in rice prices was the 'final blow' that sent Asian economies into a full-scale food price crisis in 2007-08, we first try to identify what caused global rice prices to surge. The stock-to-use ratio, which is typically used to measure the sensitivity of prices to a change in the supply-demand balance, fell to a historically low level in 2004 (Exhibit 5). This was due to a drop in global production and a decline in stocks (especially in China). However, while the low level of stocks relative to usage increased the risk of a price hike, the major jump in prices did not happen until late 2007/early 2008 when the stock-to-use ratio had in fact already recovered slightly.

**Exhibit 5: Global stock-to-use ratio has been low since 2004**



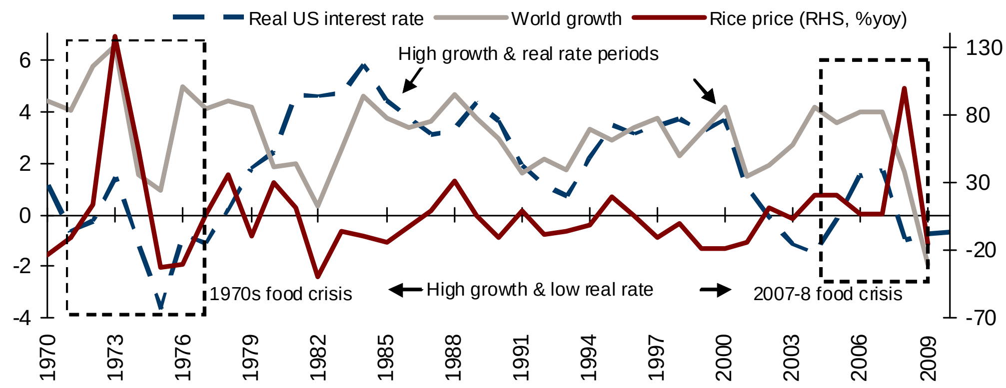

*We used the 100 percent grade-B white rice price as the proxy for global price.
Source: IRRI, USDA, Credit Suisse

**Low global real interest rates in 2007 may also have contributed to the global grain price spike in that year**

In theory, low real interest rates can lead to higher rice prices via two related mechanisms. First, low real rates imply abundant liquidity for investors to buy assets such as commodities (including rice) and for consumers to purchase food products. Second, low real yields on fixed income instruments mean investors must look elsewhere for higher returns, making commodities in general more attractive (in relative terms) as an asset class.

Even if rice may not be as readily available to speculators as many other commodities such as metals, oil, and wheat, where futures markets are more established, it is still indirectly subjected to these forces because of the cross-commodity linkages. Higher energy prices, for example, do not only raise the cost of rice inputs (e.g., fertilizers) and transport costs, but also divert feed and food crops towards biofuel production. In addition, these crops (e.g., corn, cassava, maize) compete for land use and labor normally used for growing wheat and rice.

**Exhibit 6: High world growth and low US real interest rates during the two major food crises**



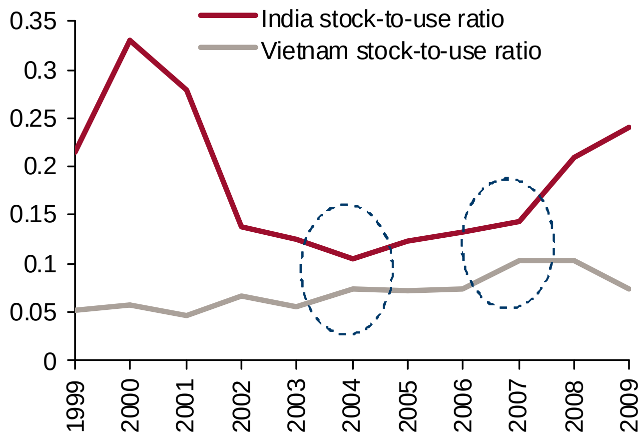

*We calculated the real US interest rate using the 3m Treasury bill rate deflated by the US chained GDP deflator.
*We used the 100 percent grade-B white rice price as the proxy for global price.
Source: World Development Indicators (WDI), CEIC, IRRI, Credit Suisse

Exhibit 7 shows that the past two food crises coincided with periods when global real GDP growth was relatively high and US real interest rates were low compared to the historical average between 1960 and 2007. However, while this provides *prima facie* evidence of macro-led food price hikes, it again fails to explain the timing of the crisis. In fact, we found that US real interest rates increased in the periods leading up to the food crises, albeit to levels that were still lower than the historical average.

**Low wheat stocks, particularly in India, were an important trigger for the rice price spike in 2007-08**

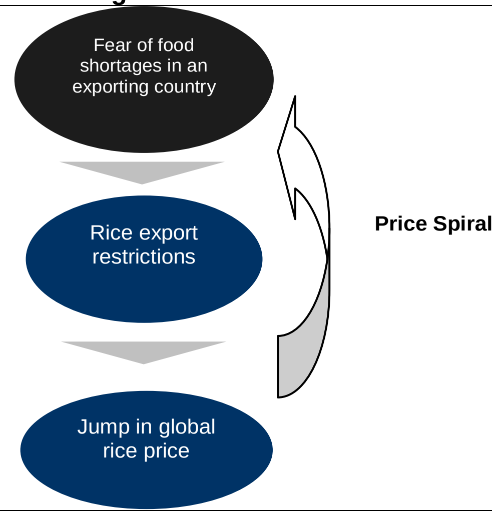
In our view, the sharp increase in global wheat prices in 2007 was caused by weather problems that significantly reduced the expected wheat supply. The real trigger, however, for the subsequent rice price crisis was concerns about general food shortages at the level of individual user countries. Interestingly, these concerns may at first sight appear not to have been entirely warranted in some cases. For example, the domestic rice stock-to-use ratio was not particularly low in India, which was the first country that imposed restrictions on rice exports (Exhibit 7). In fact, in both India and Vietnam, the two main exporters that resorted to export restraints, the stock-to-use ratio for rice had already recovered from the lows seen in 2004. However, in the case of India, it is important to keep in mind that the starting point of the crisis involved a sharp increase in global wheat prices, with India's stock of wheat hitting a historical low around 2007 (6% of local usage as opposed to the 17% average over the period 1960-2010).

**Exhibit 7: Domestic rice stocks were not the problem**




Source: USDA, Credit Suisse

**Exhibit 8: An upward price spiral stemming from the fear of food shortages**



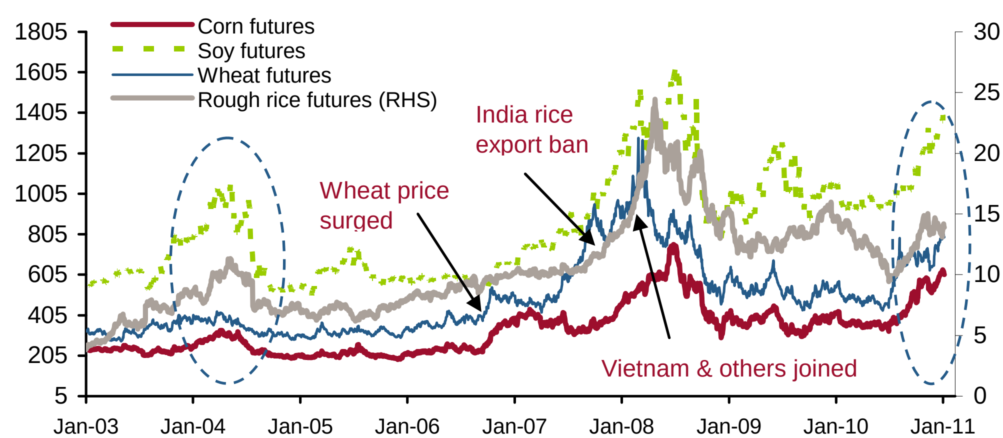

Source: Credit Suisse

Concerns over food shortages – driven by the low level of wheat stocks – appear to have been the main factor that encouraged the Indian government to impose a minimum export price on rice, an important potential substitute for wheat, in October 2007. This resulted in higher global rice prices and sparked the global concern about rice shortages that pushed other major exporting countries such as China and Vietnam to impose restrictions, thereby exacerbating the upward price spiral (Exhibit 8).

Exhibit 9 shows that global rice prices had not risen sharply in the run up to October 2007 when India imposed the first rice export restrictions. However, wheat prices in particular had already more than doubled by that time due to a series of wheat export restrictions implemented by countries such as Argentina, India and Russia, sparked by concerns about wheat shortages after a severe drought hit Australia's wheat production in late 2006. After the first price restriction on rice exports, rice prices increased rapidly and accelerated further after Vietnam and other exporters enacted their own restrictions in March-April 2008.

**Exhibit 9: Cross-commodity spillover**

USD per bushel for wheat, corn, and soy; USD per hundredweight (cwt) for rough rice.




Source: the BLOOMBERG PROFESSIONAL™ service, Credit Suisse

**In general, large increases in global prices of one of the main grains have considerable potential to spill over into large increases in the prices of other grains**

In fact, Exhibit 9 also illustrates that food commodity prices generally tend to spike largely in tandem. Back in 2003-04, a rice price spike was preceded by a soy price spike. In 2010, the sequence involved an initial move up in wheat prices, followed first by soy prices and then by rice prices. The price spillover from one commodity to another could be explained both by demand substitution from one food staple to another, and by supply-side substitution given that crops share factors of production, as explained above. The cross-commodity spillover implies that we have to look beyond one food commodity to assess the probability of a food price crisis in Asia.

Exhibit 10 summarizes the chronology of rice export restrictions imposed by major exporting countries in 2007-08. It is also important to highlight that the price increase coincided with the launching of tenders by the Philippines, one of the world's largest rice importers, for the import of several hundred thousand tonnes of rice each time, bidding up the prices.

**Exhibit 10: Chronology of selected countries' measures to curb exports**

| Date | Country | Restrictions |
|---|---|---|
| October 2007 | India | Ban on export of non-basmati rice, but export of superior varieties allowed. Minimum export price of $650/tonne |
| December 2007 | China | Tax on rice exports, revocation of VAT rebate on grain exports |
| March 2008 | India | Complete ban on exports of non-basmati rice |
| | Vietnam | Ban on rice exports until June 2008 |
| April 2008 | Pakistan | Exports restrictions on private trade |
| April 2008 | Egypt | Ban on exports until October 2008 |

Source: USDA, Credit Suisse

**China led other NJA food inflation or wheat led rice price?**

In light of this wheat-led rice price crisis in 2007-08, let us re-examine the patterns observed earlier in Exhibit 2 – that China's food inflation led other NJA economies'. We think that this was in fact another manifestation of how the rice price crisis was preceded by the wheat price hikes. Compared to other NJA economies with the exception of India, the ratio of wheat-to-rice consumption is much higher in China (e.g., the ratio in 2009/10 was about 1:1.5 for China, whereas it was 1:5 in Indonesia). This means that China was more exposed to the wheat price surge that occurred in late 2006 than these economies. We also find that India, another major wheat consumer, also saw its food inflation picking up before the rest of the region during the 2007-08 episode. Therefore, in our view, the key question is not really whether high food price inflation in China will leak to other NJA economies, but whether there are 'time bombs' in any major commodity that could explode and spill over into other food commodities. With these key takeaways, we examine below recent food commodity price developments and fundamentals in the key markets to assess the likelihood of another food crisis.

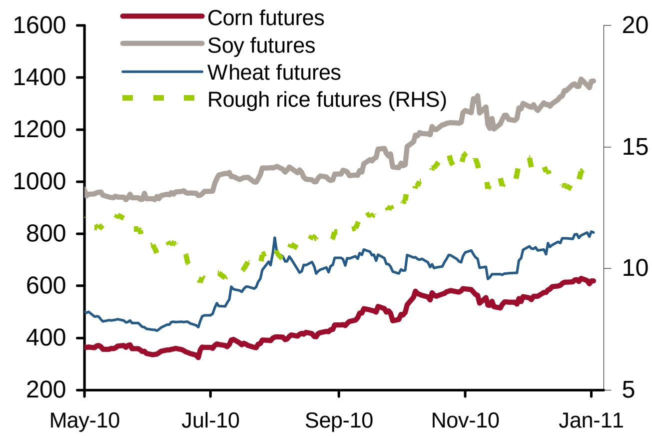
## Are the conditions ripe for another 'perfect storm'?

**Further global grain price increases will probably require additional weather shocks**

Without additional weather shocks or panics, we do not expect a full-blown food price crisis in 2011.First, global dollar prices of grains have already increased markedly since the middle of 2010, by 50%-70%. The starting point was the severe drought in Eastern Europe that drove up wheat and barley prices sharply in July and early August. Prices of corn, soy and rice rose equally sharply, with a lag of a few months. Global grain prices then stabilized in October-November and traded in a relatively narrow range before resuming their rise in December (Exhibit 11). It is too early to tell whether the recent rise reflected seasonal or structural factors, but we think it would require a new shock to keep the price increases going. Favorable shocks (driving prices lower) would seem as likely as unfavorable ones, and we believe the risk of a jump in speculative demand for grains has fallen significantly in the past two months as 10-year US Treasury yields have risen by more than 100 bps.

**Exhibit 11: Grain prices (generic futures contract)**

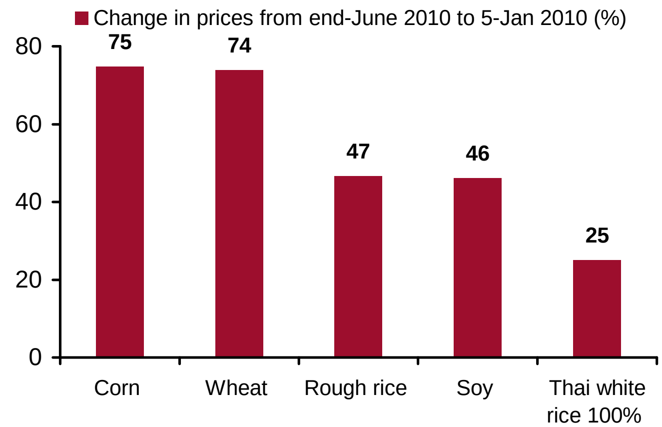
USD per bushel for wheat, corn, and soy; USD per hundredweight (cwt) for rough rice.




Source: the BLOOMBERG PROFESSIONAL™ service, Credit Suisse

**Exhibit 12: Grain prices showing double-digit rises**

USD per bushel for wheat, corn, and soy futures; USD per hundredweight (cwt) for rough rice futures; USD per metric ton for Thai white rice spot.



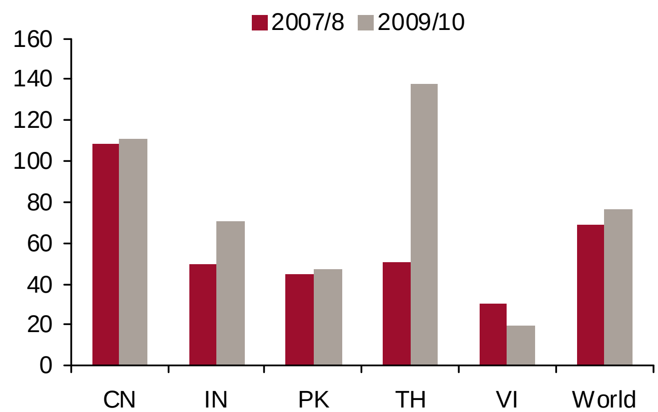

Source: the BLOOMBERG PROFESSIONAL™ service, Credit Suisse

A potential shock that might directly affect rice prices is last year's heavy flooding in Pakistan, Thailand, and Vietnam, which could have destroyed a large area of rice paddies. The International Rice Research Institute reported on 9 November 2010 that global production of milled rice may be 450 million metric tons in 2010-11, 10 million tons less than it initially expected. The US Department of Agriculture also estimated that global milled rice output in 2010 would fall 171,000 tons short of its forecast for global demand for the first time in four years. Now supply could be even lower than the US Department of Agriculture's most recent forecast, given the impact of flooding in Thailand in October. In addition, the damage from the flooding has not been finalized, and thus it is possible that actual output might be lower.

**Stock-to-use ratios in exporting countries are not very low by historical standards**

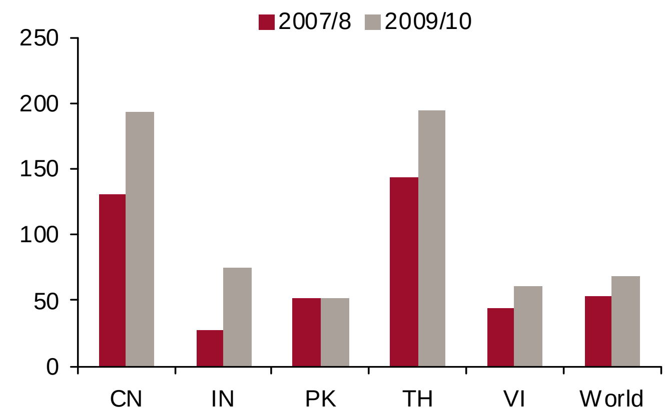
Another key issue is what is happening to stock-to-use ratios in individual exporting countries for both rice and – learning from the past crisis – wheat. These are the two food commodities that were subjected to various export restrictions and rationing by individual countries' governments. Exhibits 13 and 14 show the ratios for both rice and wheat, converted into the number of days that the countries could satisfy their domestic consumption. These ratios are now at a more comfortable level than in 2007-08. In particular, in India, the number of days the country could meet domestic demand using existing stocks rose from less than 30 days in 2007/08 to about 80 days in 2009/10. While Vietnamese rice stocks are projected to decline, the minister of agriculture and rural development said in an interview with Bloomberg on 9 November 2010 that the floods in Vietnam mainly hit the central region, and not the rice-growing area in the southern part of the country. Vietnam, the world's second largest rice exporting country, exported around 6.7 million tons in 2010, an 11.1% year-on-year increase. This could also explain why we have not seen an acceleration in commodity food prices of the sort witnessed in 2007-08 after the flooding episodes.

**Exhibit 13: Rice stock-to-use ratio for major rice exporters (in number of days they could satisfy domestic consumption and maintain exports)**




*The figures for 2009/10 are USDA projections.
Source: USDA, Credit Suisse

**Exhibit 14: Wheat stock-to-use ratio for major rice exporters (in number of days they could satisfy domestic consumption and maintain exports)**




*The figures for 2009/10 are USDA projections.
Source: USDA, Credit Suisse

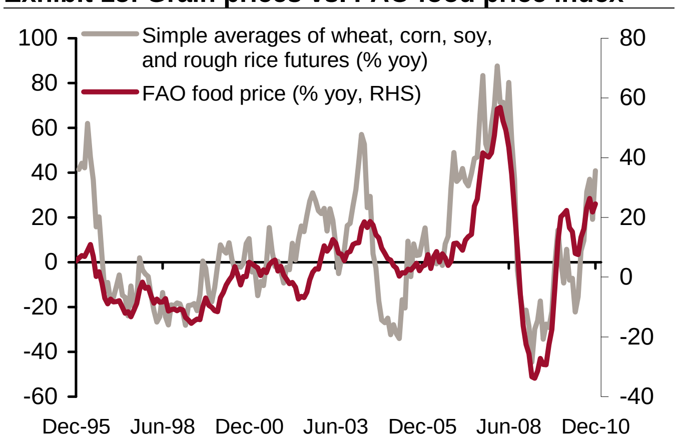
**The recent rise in global grain prices is worth monitoring closely**

In an earlier report, *Asia: Food for thought* (8 August 2010), we argued that the spike in wheat prices in July was not yet a problem for the ASEAN economies, but we found it worthwhile to monitor closely whether wheat prices would continue to rise and set off an increase in other grain prices. After another rise in global grain prices in December, prices seem to have stabilized in early January. However, we believe it is too soon to draw any strong conclusions on food price inflation.

**Grain prices are decent lead indicators of overall food prices in NJA**

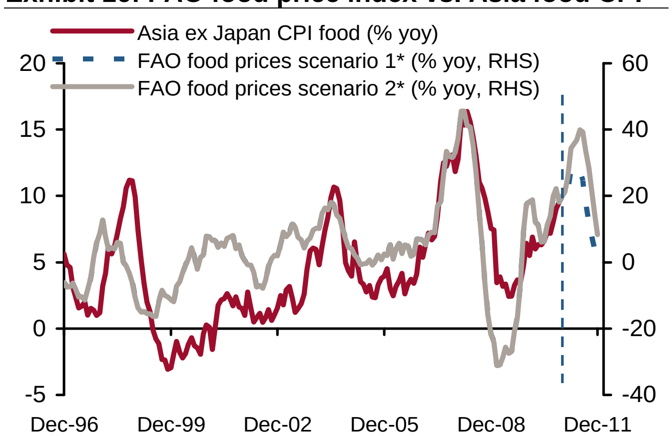
As Exhibit 15 shows, changes in US grain futures prices sometimes provide a short-term lead to overall global food prices inflation (as measured by the UN Food and Agricultural Organization's (FAO) dollar food price index); the latter in turn moves closely in line with food inflation in Non-Japan Asia. This is not surprising, given that grains, besides being directly consumed, are also used as animal feeds and ingredients for processed foods. In addition, the US futures markets for wheat, corn, and soy are quite liquid (as opposed to those for rice) and tend to respond quickly to supply shocks that might also affect other food prices. Although Asia is the main exporter of rice, it is a net importer of soy and corn, so higher grain prices would probably also lead to higher meat prices in the region.

**Exhibit 15: Grain prices vs. FAO food price index**




Source: CEIC, Food and Agriculture Organization, Credit Suisse

**Exhibit 16: FAO food price index vs. Asia food CPI**




Source: CEIC, Food and Agriculture Organization, Credit Suisse. *We deflate the FAO food price index by an NJA exchange rate index weighted by nominal GDP. Scenario 1: Food prices rise by around 8%-9% in local currency terms in 2011. Scenario 2: Food prices remain unchanged at December-2010 levels.

Our global commodity team expects grain prices to rise by another 13%-14% in 2011 from Q4 2010's levels, which, given our currency forecasts, would translate into about an 8%-9% increase in NJA food prices in local currency terms. Based on this forecast, the FAO measure of food commodity price inflation would peak in mid-2011 at around 40% yoy, which is close to the peak in 2007-08, before falling back to high single digits by end-2011 (Exhibit 16).. This implies that NJA food inflation might rise to about 15% by mid-2011, adding a further 1.5pp to headline inflation. However, it is worth bearing in mind that the nominal GDP-weighted aggregate CPI food index for NJA is dominated by China, and the impact on food inflation from higher grain prices will differ for each economy.

## What would happen if a food crisis were to occur?

Given that additional supply or demand shocks cannot be ruled out, it is worthwhile to check how vulnerable the different NJA economies would be if a similarly large global food price spike were to occur this year.

One common way to estimate the impact on CPI inflation of higher food prices is to use the weights of food in each country's CPI basket. This would suggest that the Philippines is the Asian country that is most exposed to higher global food prices (Exhibit 17).

**Exhibit 17: Weights of food in the CPI basket**

| | Food | Food ex processed/cooked food | Rice, bread, cereal related | Rice | Meat and poultry |
|---|---|---|---|---|---|
| Philippines | 46.6 | na | 13.3 | 9.4 | 7.6 |
| Vietnam | 39.9 | 32.5 | na | na | na |
| China | 34.0 | na | na | na | na |
| Thailand | 33.0 | 18.6 | 2.9 | 2.1 | 3.4 |
| Hong Kong | 32.1 | 13.5 | 1.8 | 0.4 | 2.5 |
| Malaysia | 30.6 | 19.6 | 4.6 | na | 2.9 |
| Indonesia | 29.9 | 19.6 | 4.7 | na | 2.5 |
| India* | 26.9 | 15.4 | 6.5 | 2.4 | 1.1 |
| Korea | 26.4 | 13.3 | 2.8 | na | 2.1 |
| Taiwan | 26.1 | 17.0 | 2.0 | 0.5 | 2.3 |
| Singapore | 22.1 | 8.5 | 1.7 | 0.4 | 1.4 |

Source: CEIC, Credit Suisse

However, there are several reasons why this simple analysis might not accurately capture the impact of food price hikes on inflation:

- Some countries import most of their food, while others rely more on domestic consumption and many have domestic food markets that are heavily segregated from international markets by high trade barriers.
- The increase in global food prices may not be fully passed on to consumers, but absorbed by the producers or the government. This is not only because of trade barriers, but also because of domestic price controls and subsidies.
- The impact on overall CPI inflation in a particular country of an increase in global food prices will depend not only on the increase in food prices in that country but also on how much the rise in food CPI feeds into core inflation. This depends in turn on factors such as the central bank's credibility in terms of fighting inflation, the nature of the labor market, and the strength of demand.

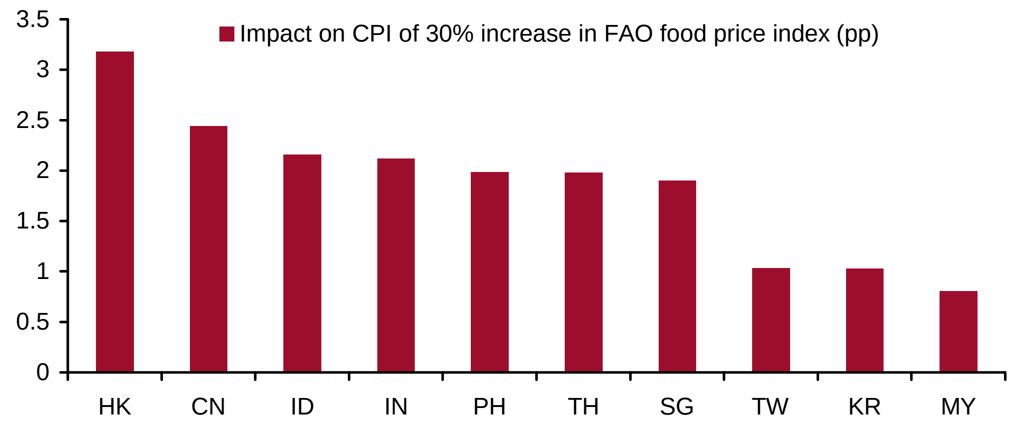
Ideally, therefore one would want to isolate the impact of global food prices on CPI inflation from other factors that also affect the CPI. To achieve this, we have created an equation that incorporates four key factors that influence a country's CPI inflation rate, namely: GDP, exchange rates, commodity prices, and inflation momentum. All variables

are percentage year-on-year changes, with appropriate lags as indicated by statistical tests (for the details of the model, please see the footnote to Exhibit 18 below). The inclusion of changes in exchange rates is particularly important for NJA economies given how much their currencies appreciated in 2H 2010. We found that this partially absorbed the rise in commodity prices, although the degree varied across countries (see *Currency appreciation: What it means for Asia*, published on 27 October 2010).

**Scenario analysis**

In the worst case scenario, we assume that the UN Food and Agriculture Organization food price index rises by a further 30% from here.

**Exhibit 18: Estimated immediate impact (within the same quarter) on overall CPI inflation of a 30% spike in global food prices**




*The results here are based on our regression models that include the following variables: lagged CPI inflation, change in FX, lagged GDP growth, contemporaneous year-on-year change in Dubai oil price and FAO food price index. Everything is in quarterly frequency. We relied on Bayesian criteria for selecting appropriate lags for the variables. We also use heteroskedasticity and serial correlation robust standard errors in estimating our equations. We also tried using the output gap instead of GDP growth, but did not find much impact
Source: USDA, IRRI, Credit Suisse

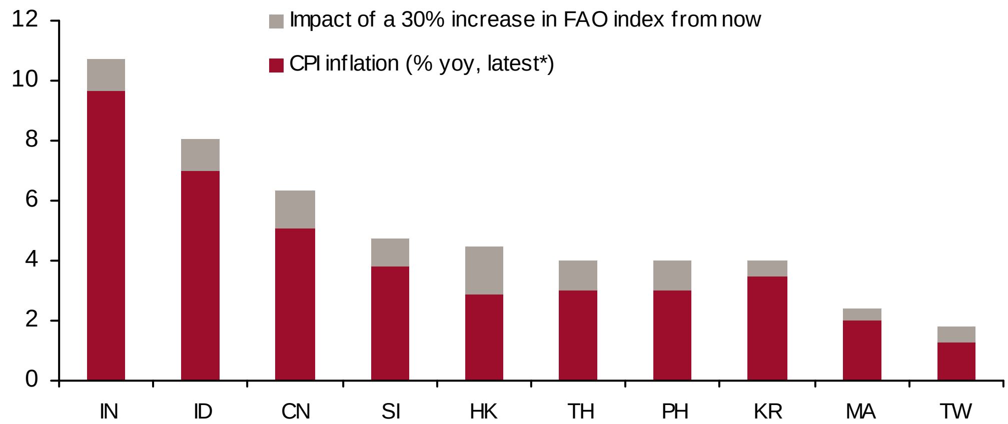
**Hong Kong, China, India, and Indonesia are the NJA countries that appear most vulnerable to global food price shocks**

Exhibit 18 shows the results for the NJA economies. We found that the impact of international food price changes on local headline CPI inflation is statistically significant and robust for all the NJA economies. China and Hong Kong are the countries where overall CPI inflation is most (among the countries in NJA) exposed to rising global food prices.

- Changes in food price inflation have been the main driver of changes in overall CPI inflation in China over the past decade, while Hong Kong's inflation is closely tied to global grain prices and China's food inflation.
- At the other end of the scale, Malaysia is one of the NJA economies that is the least affected by global grain price swings. This largely reflects the government's subsidies for paddy, rice, sugar, flour, and cooking oil.

In a 2007-08 style scenario, the four most exposed economies could experience as much as 2pp-3pp higher year-on-year CPI inflation by mid-2011, broadly consistent with the actual rise in inflation rates we observed in 2007-08. However, it must be stressed that in this exercise we are holding various factors fixed, whereas in the actual 2007-08 episodes there was an array of factors, including policies to subsidize or control food prices, that influenced headline inflation. To get a sense of perspective as to how big these shocks are, we add the additional estimated impact of the increase in global food prices to the latest headline inflation for each economy (Exhibit 19).

**Exhibit 19: Food price impact of a 30% increase in the FAO index**




Source: CEIC, UN FAO, Credit Suisse. *December data for Indonesia, Korea, the Philippines, Taiwan, and Thailand; October data for India; November data for the rest.

## Putting the pieces together: What are the implications for NJA monetary policies in 2011?

In summary, we think year-on-year food price inflation is likely to rise further in the near term. However without additional weather shocks or panics, we do not expect a full-blown food price crisis in 2011. We expect NJA food CPI inflation to peak in mid-2011 at around 15%, adding a further 1.5pp to headline inflation.

In terms of monetary policy implications, it is important to emphasize that higher food price inflation does not necessarily lead to tighter monetary policy. Central banks take into account other factors such as the strength of the regional and global growth outlook, the size of the output gap, the rate of core inflation, exchange rate movements, and the persistence of the food price shock in their policy decisions.

Nevertheless, it is likely to have an impact at the margin, adding to the existing pressure to raise policy rates and/or allow further currency appreciation in NJA. This is particularly true in China and India, in our view, where food inflation is a big issue at present.

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# EMERGING MARKETS ECONOMICS AND FIXED INCOME STRATEGY


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