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Please cite this paper as:

OECD Food, Agriculture and Fisheries Papers No. 35

Potential Market Effects of Selected Policy Options in Emerging Economies to Address Future Commodity Price Surges

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POTENTIAL MARKET EFFECTS OF SELECTED POLICY OPTIONS IN EMERGING ECONOMIES TO ADDRESS FUTURE COMMODITY PRICE SURGES

Executive Summary

This report examines the market outcomes of different policy options that could be adopted in the event of a future spike in the world price of wheat and rice, two of the most important food grains for consumption and which are often directly affected by price spikes. More specifically, the analysis attempts to answer the question: "What would happen if a group of countries that intervened in markets during the last price surge were to adopt selected policies in the future?" The impacts of these policies for the implementing countries are measured in terms of changes in consumption and expenditures, as well as on taxpayer costs. The analysis also identifies the unintended consequences for international markets and market participants in other countries that trade on these markets.

This report uses the Aglink-Cosimo economic model of global agricultural markets to assess the consequences of specific policy measures to alleviate domestic market impacts of any future surges in wheat and rice prices. The three policy options that are examined are:

a) *additional border measures* that are designed to prevent a surge in international prices beyond a 35% increase from affecting domestic prices;

b) *new consumer subsidies* to limit a rise in consumer prices by only 20% in the event of a surge in international prices by a greater extent; and

c) *additional public stockholding* of up to a third of domestic consumption that are held and then released onto domestic markets, if domestic prices rise by at least 40% in a specified period.

It is assumed that each of these policy options is adopted by a group of ten countries rather than by a single country and applied collectively by the entire group. The ten countries chosen are Argentina, Brazil, Chile, China, India, Indonesia, Russia, South Africa, Ukraine, and Vietnam. These are countries that applied *ad hoc* policies to combat the effects of the last price surge in 2007-08.

The key findings are as follows:

These policies can have large effects in constraining the increase of domestic consumer prices from a surge in world prices, but typically have smaller effects on the quantities consumed.

a) Consumer subsidies target consumer prices directly and limit upside swings in consumer prices. Border measures lower all domestic prices, including consumer prices. Public stocks work only if the accumulated volume of stocks represents a large share of the relevant market, local or global, so that their release alleviates a tight market for the commodity (at least until stocks are gone).

b) Total consumer demand for staple grains is inelastic, particularly if all grain prices rise. Higher grain prices do not depress the average quantity of consumption proportionately, but increase food expenditures that raise other challenges for consumers. Policies that reduce consumer prices by some percent from their international peaks increase consumption by a smaller proportion.

Taxpayer effects can be quite large. Consumer subsidies and public stocks can be very expensive.

a) Taxpayers pay for a subsidy given to consumers; costs quickly climb into the billions of dollars to support staple grain consumption in a heavily populated country. Accumulating and holding public stocks is expensive with associated market impacts given the volumes that must be acquired and held to temper any surge in prices. Border measures have ambiguous effects: revenue is lost if import tariffs are lowered to offset rising international prices, but revenues rise if export taxes are used at such times.

These domestic market interventions can have unintended and unwanted consequences, including further destabilising international markets and causing higher prices for foreign consumers (and producers).

a) Border measures and consumer subsidy policies in the selected 10 countries reduce supplies available to international markets and cause a greater price increase to consumers in other countries. Policies that insulate domestic consumers or producers from responding fully to an international price surge exacerbate the world price increase and force greater adjustments on producers and consumers in other countries to sell even more or buy even less in order for supply and demand to adjust to the higher peak prices. In the scenarios explored here, border measures cause world prices to increase by much more than consumer subsidies do.

b) Border measures also lower returns to domestic producers, suppressing long-run supply response.

c) The release of public stocks can buffer rising domestic prices for all consumers and producers during the price spike, at least while stocks last, but the stock accumulation and subsequent rebuilding phase of public inventories increases prices for all consumers both in domestic markets and internationally.

In summary, none of the policy options examined worked particularly well. For a small effect on consumption in the countries that implement one of these policies, the costs to taxpayers, producers, and foreign consumers are high. The consumer subsidy experiment tested here has perhaps the least negative consequences, and some targeted subsidy within budget limits is one approach that might merit further consideration.

1. Introduction

The 2007-08 surges in agricultural commodity prices to near historical highs had global impacts (Figure 1). Widespread complacency about food availability was replaced by fears about future food security. Concern was not limited to the hundreds of millions who have been food insecure for decades. The number of people going hungry increased due to higher prices. In addition, many more consumers, who devote a large share of their household budgets to food requirements in normal times, were forced to spend an even higher share of their household budget to food, foregoing other critical expenditures. Public protests in many countries gave evidence of the severity of the problem.

Figure 1. Rising world indicator rice and wheat prices, 2000-07 crop years
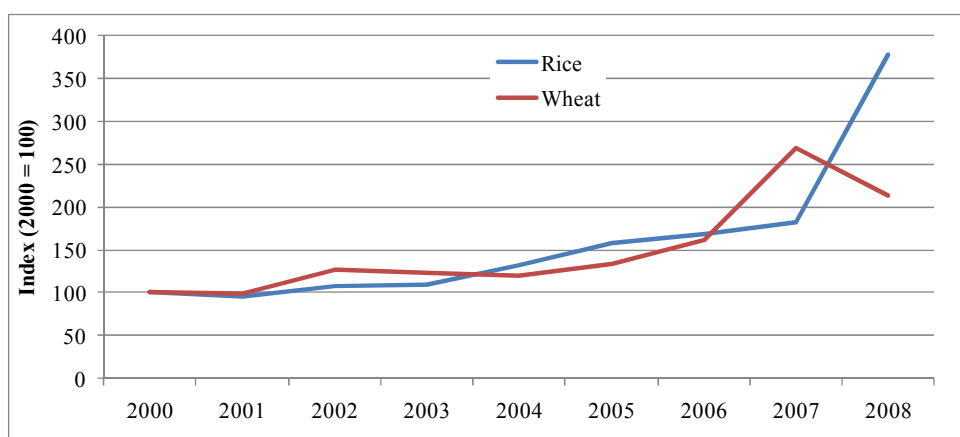
Source: OECD-FAO Agricultural Outlook, 2010.

In response to the food crisis, the priority of agricultural and food policy in many countries turned towards mitigating price rises. Decisions were made quickly to find the most expedient methods to alleviate the effects of climbing prices on domestic consumers. These policies are summarised elsewhere.[1] The policy responses were typically one or two types: border measures to reduce domestic prices relative to rising world prices, or measures that subsidise consumers directly or through price controls. Other measures such as subsidies to production, although not covered in this analysis, were also introduced presumably to help combat any long-term trend towards rising agricultural commodity prices. The initiatives taken by a number of countries to try an insulate their domestic markets from rising international prices had the unintended consequence of adding further upward pressure on world prices, exacerbating the price increases that other countries faced at the time.

Subsequent events disproved the initial claims by some observers that prices would remain at these high levels or even continue to rise into the future. Instead, most crop prices have fallen with the average level of wheat and prices in the 2010 crop year expected to be about 35% below their 2007-08 peaks.[2] Nevertheless, these prices remain higher than they were before the surge began.

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[1] See "Policy Responses in Emerging Economies to International Agricultural Commodity Price Surges" (Jones and Kwiecinski, 2010).

[2] Price and quantity data used in this report are from the OECD-FAO Agricultural Outlook, 2010-2019, unless otherwise specified. Crop year averages are used throughout this report.

The unsettling experience of the recent period of peak prices has had some lasting effects. While a repetition of the 2007-08 price spikes is not anticipated in the near term, such events will probably recur at some point in the future, if history can provide any guide. As a result, policy makers have begun to focus on what policy options or measures to use in the event of a future price surge. Perhaps it is for this reason that some of the *ad hoc* policies introduced during the 2007/08 commodity price surge still remain in place in a few countries. Discussions at the OECD Global Forum on Agriculture in 2009 in the aftermath of the price crisis made the point that, in the absence of new, longer term policies to manage such risks, similar short term policy responses could be expected.[3]

This report examines the market outcomes of different policy options that could be adopted in the event of a future spike in the world price of wheat and rice, two of the most important food grains for consumption and which are often directly affected by price spikes. For the purpose of the analysis the Aglink-Cosimo model[4], as maintained by the OECD and FAO Secretariats, is used to quantify the market effects of selected policy options. This model is a partial equilibrium model of world markets for the main temperate zone, agricultural commodities. Equations specify production consumption, stocks, trade, and prices in many individual countries and a few regional aggregates for 15 agricultural commodities. The latest baseline from the model for the period 2010-19 forms a reference scenario for comparison with the market outcomes of the different policy options.

The model is employed to simulate what would happen if there is another price surge, similar to the 2007/08 event, at some time within the next 10 years. These price surge simulation experiments are performed both with, and without, the different policy options being implemented by the group of ten countries to limit the impact of an international price surge on domestic consumption and their markets. The results are then contrasted with a future situation of no price surge and no policy options being applied by the select group of countries (the baseline or reference scenario). The analysis is then extended to examining the consequences for the rest of the world of the policies applied by the selected group of countries. This assessment is made by analysing the market adjustments that occur for these countries as a result of the surge in world prices that result with, and without, the implementation of the different policy measures in the selected ten countries.

As usual, it needs to be recognised that there are limits to empirical models. In this case, the key limitations are the focus on national consumption, which is not disaggregated enough to identify the different consumer groups within the population whose situations are most at risk or uncertain in terms of having access to sufficient food at times of high prices. Also the model is calibrated to an annual cycle and as a result the crop year data found in the model does not permit an analysis of within-year price variation which is likely to be greater. For ease of analysis, a standardised domestic price increase has been assumed as the trigger for each policy option rather than replicating exactly what each country did in response to the price surge in the historical period. In other words, it is assumed that the same percentage price increase, or price threshold, is used by all the ten countries to trigger a market intervention under each policy option, although this percentage varies by policy option being examined. Varying triggers by country would add complexity as relative levels of intervention among the ten countries would have to be compared, and the unintended consequences of countries that take dramatic actions might overwhelm the efforts of countries that intervene in the markets more modestly. Policies often targeted other commodities, but here the focus is maintained strictly on the two key grains that are traded internationally: rice and wheat. The focus on these two commodities allows consumers greater flexibility to respond relative to the case of a shock to all commodity markets; many food and feed buyers will turn to substitute goods. If we explored a shock that

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[3]   See the Global Forum on Agriculture website: web site: www.oecd.org/agriculture/globalforum/june09.

[4]   More explanation on the model can be found at www.agri-outlook.org

caused an equal spike in all commodity prices, then consumers would have little option but to pay the additional costs. The impacts on overall food consumption are typically smaller than the effect on one or two commodities, so the results here may overstate both the initial effect and the potential for policy to alleviate the overall effects as compared to the case of an increase in all commodity prices.

This report stands out from existing research based on economic models that represent markets because it examines the following types of questions in a forward looking assessment: What if countries were to adopt policies to counter-act or alleviate the effects of future surges in international prices? What would happen if these policy recommendations were adopted by an entire group of countries? What would happen in countries that apply these policies? What would happen in countries that do not apply these policies? How would consumers, producers, and taxpayers in the different countries be affected? In this report, we use this standard approach in economic analysis to address these questions.

Much of the earlier work is backward-looking, such as the studies reviewed by Tyner, Abbott, and Hurt (2008, 2009). These and other studies generally focus on the contribution of various factors to the rise in world commodity prices, sometimes in a forward-looking context (Dewbre *et al*. 2008; FAO 2008; IFPRI 2007, 2008; Meyers and Meyer 2008; OECD-FAO 2008; World Bank 2008). The contribution of policy, other than those relating to biofuels, to the exacerbation or alleviation of price spikes is rarely assessed using these models, even in the historical period. Mitra and Josling (2009) and Nogués (2008) did examine selected instances of export barriers during the recent price surge. There is considerable discussion about possible policy responses that countries could adopt to stave off the worse effects of price surges in the future, but economic models representing grain markets are not used to analyse the effects of these options. This report tries to correct this important omission.

2. Market effects of policy options to mitigate sharply rising prices or price spikes

The three policy options explored in the paper to ameliorate the risk of price surges on domestic markets are chosen based on observed responses to the recent price spike.[5] The three policy options explored here are:

1. *additional border measures* that are designed to prevent a surge in international prices beyond a 35% increase from affecting domestic prices;

2. *new consumer subsidies* to limit a rise in consumer prices by only 20% in the event of a surge in international prices by a greater extent; and,

3. *additional public stockholding* of up to a third of domestic consumption that are held and then released onto domestic markets, if domestic prices rise by at least 40% in a specified period.

This analysis focuses on each policy option in terms of its effectiveness (as measured by impact on domestic consumption) and how it affects markets. Each policy option is examine separately. Little or no value is seen in having a combined experiment that assumes all three policies are in place all at once.[6] Relevant information about each policy option is discussed in what follows prior to the analysis of its estimated impacts. The policy intervention begins once a pre-determined trigger level is exceeded by the

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[5]   We omit production subsidies. Production subsidies are a way to increase overall level of output, and might help to avert price spikes if they reduce the likelihood of shocks, possibly by diversifying supplies.

[6]   The OECD review of policy responses shows that many countries tried these and other policies concurrently to address the price surge. However, the objective here is to estimate clearly the effects of establishing such policies in a forward-looking context, not to reproduce what measures policy makers seized upon in reacting to the recent price surge.

year-over-year increase in the domestic price. Once triggered, either border measures sever the connection with the world market for further domestic price changes, consumer subsidies stop the increase in consumer prices, or the release of public stocks slows the increase in consumer and producer prices (at least until the available stocks are completely dissipated). The triggers are set somewhat arbitrarily, but are selected to generate some benefits for domestic consumers that might be large enough to be judged acceptable, before considering the costs. This representation of policy is not intended to recreate the responses to the last price shock. Observed market interventions started at different times and took many different forms, which would distract from the broader points addressed here – namely, the effects of these policies on domestic consumers and the unintended effects on other agents in the market.

The same set of ten countries is assumed to use the same policy measure for each experiment. These countries intervened in markets during the last price surge.[7] The countries chosen for examination are:

- Argentina,
- Brazil,
- Chile,
- China,
- India,
- Indonesia,
- Russia,
- South Africa,
- Ukraine, and
- Vietnam.

The combined population of these countries is over 3 billion people, and represents about half the world's population. In the 2010/11 marketing year, these countries account for about two-thirds of rice consumption and production, 45% of world wheat consumption for food, and 43% of world wheat production (Figure 2). The chosen countries are obviously particularly sensitive to sharply rising domestic prices having adopted policies to ameliorate such effects in the last price surge of 2007/08. However, there is no intention to imply that these countries would implement the policy options examined here in response to future price spikes. Instead, these countries are selected because they are important consumers and producers of the two grains under consideration and simply to illustrate what could occur if countries applied a set of policies in a collective manner to combat rapid price inflation on their home markets that originates from international markets.

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[7] See "Policy Responses in Emerging Economies to International Agricultural Commodity Price Surges" (Jones and Kwiecinski, 2010). Other countries are affected by price surges and might consider these policies as well. The impacts would go in the same direction as for the countries examined here, but the scale would depend on the degree of the intervention and the size of each country's market relative to world markets.

Figure 2. Shares of experiment countries in world grain food use and production, 2010/11 estimates
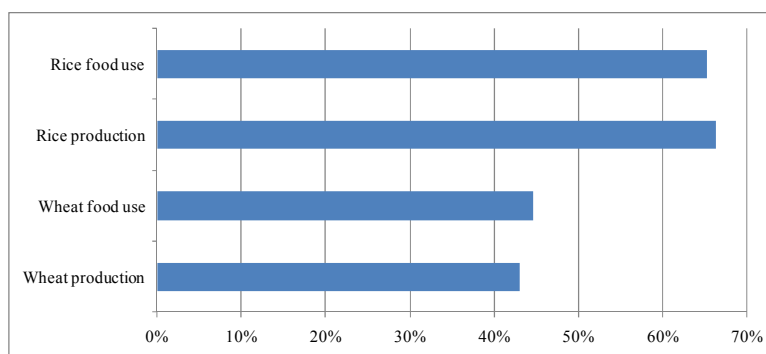
Source: Calculations based on data from OECD-FAO Agricultural Outlook, 2010-2019.

Other Non-Member Economies (NMEs) that do not use these policies

The analysis also highlights the impact of the different policy options on countries in the rest of the world which are outside the group under review. Market intervention in one country will inevitably affect quantities traded relative to what would happen without the policy. Policies to limit the impact of rising international prices on consumers in one country by restricting adjustments in demand force prices to rise even more on world markets and for consumers in other countries. The impact for market participants in a set of other Non Member Countries (NMEs) that do not use these policies is presented in the analysis. Market impacts for OECD countries are not shown per se, but the directional effects tend to be the same as for the other NMEs outside the specific subset of ten countries that are assumed to adopt the different policies.

The next price surge?

If history is any guide, another period of high prices or a price spike can be expected at some time in the future given the uncertainties of weather, macroeconomic factors, energy prices and policy interventions. However, the analysis undertaken here does not presume to make any prediction about the timing of the next price surge or its magnitude. Rather, a stylised or hypothetical assumption of a future high price event is modelled with a view to approximating the recent spikes in grain prices.[8] For purposes of the current analysis a price event similar to the 2007/08 surge is selected to reoccur in 2013. The initial increase or spike in world rice and wheat prices is set at a year-over-year 70% increase (Figure 3). However, once the different policy experiments are implemented the resulting world price increases in the residual markets outside the selected sub-group of ten countries will be larger depending on the type of policy intervention being pursued.

The one-off factors that give rise to a price surge in marketing year 2013 are assumed not to continue after that year. Nevertheless, the model will endogenously determine how the trend in world prices change after the initial one year shock. Typically prices should fall below the baseline levels in the following marketing year, because of a lagged supply response to the initial price increase. By the end of the baseline

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[8]   A price increase is defined which is consistent with the observed historical shocks, and then the model is solved to determine the level of exogenous market shock necessary to achieve this price level. We do not base the price shocks on any particular factor. This exogenous shock is used to reproduce the price spike with and without the new policy responses in place. In the case without the policies, the end result is the target price spike. If there are automatic responses, then these responses will affect not only domestic but also world markets, causing a different magnitude of change in world prices.

period, in marketing year 2019, the transitory effects of an assumed surge in prices in 2013 will have worked their way through the system with the result that world prices are roughly the same by the close of the baseline period as what they would have been in the absence of the price surge.

Figure 3. International rice and wheat prices, with and without surge in projection period
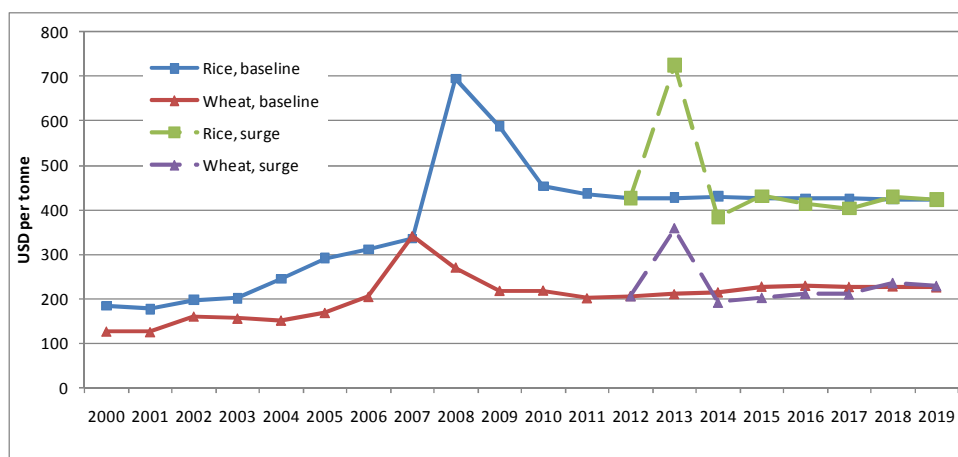
Source: OECD-FAO historical data through marketing year 2009 and simulation results for marketing year 2010 on. Price surge shown represents the case without any new policy interventions.

These policy options might have some administration or logistic costs even if they are not triggered. If this should be the case, then there is a possibility that these costs will be incurred in the next ten years, even if a sharp price surge event does not occur. The likelihood of another price shock taking place of the magnitude of the 2007/08 event, within the next 10 years is unpredictable. However, more than thirty years separates the 2007/08 price spikes from the previous one, which occurred in the early 1970s. If a policy of targeted consumer subsidies were adopted and the authorities collected data to enable quick action in the event of a price surge, then this information might be maintained for decades before being used.[9] Readers must take into account the possibility that there is no price spike within the coming ten-year period, a point that is returned to during the following discussion.

2.1 Border measures

Key facts about this policy scenario are as follows:

The new border measures are additional mechanisms, on top of the existing set of measures that may be in place in different countries, and which automatically sever the link or co-movement between rising external prices and domestic prices. It is assumed that the minimum increase in the annual average rice and wheat border prices to trigger these measures must be equal or superior to a 35% year on year change.

In practice, the new border measures are assumed to prevent the pass-through of international prices onto domestic prices. More specifically, this means countries would lower import tariffs or tax exports depending on their trade status as an importer or exporter.[10] Both have implications for taxpayers as well as

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9   A participant at the OECD Global Forum on Agriculture of 2009 stated that some countries put in place the mechanisms of such a targeted consumer subsidy in the mid-70s but discontinued them after years of disuse.

10   The question about tariffs is not addressed here: are they big enough in each case to support the magnitude of the reduction in question, or is there an implicit subsidy of imports. In either case, the taxpayer and

for market prices, but no explicit assumption is made about the broader effects of increases and decreases in national budgets.

Once triggered, the domestic price is insulated from further increases in international prices. However, the domestic price will have increased already because of the increase in border prices up to the trigger level. Hence domestic prices will be higher than the price in the preceding year because of the world price surge.

All the ten countries within the selected group are assumed simultaneously to impose this new border policy on their rice and wheat trade (on top of any trade restrictions that may already exist).

Market effects

The price surge effects on domestic prices with additional border measures are compared with the case of a price surge without changes in border measures (Table 1). Prices are expected to be higher than in the previous year in either case because of the price surge. The question is whether the border measures make prices lower than they would have been without this additional intervention.

The initial effect of these new border policies is on domestic market prices in countries that intervene in trade to curtail the transmission of world price increases into their domestic market. The analysis suggests that producer price increases are less than half as much, on average, with border measures implemented – which is not surprising given that these measures are triggered at half the amount of the full 70% price surge. The effects vary somewhat by country, but new border measures have less effect for Chinese food grains, wheat in India, and rice in Indonesia.[11] In these cases, even without the additional policy intervention, trade constraints already exist. The causes are partly policy interventions, but also natural barriers to trade such as distances over which goods must be shipped. The surge in the international price of grains never has a one-for-one effect on the domestic market prices for any country with pre-existing policy or natural barriers to trade. Additional intervention magnifies the effects of such existing measures or barriers by reducing further the effect that international price changes have on domestic markets.

market effects are the same, but it is acknowledged that the standardized representation misses the possibility of practical limits. We do not address the likelihood that a country with a history of using import tariffs to prevent imports – even though doing so is at the cost of higher prices to consumers – would go so far as to subsidise imports in the event of a sharp rise in border prices.

[11]   The OECD-FAO baseline projects declining rice prices in Indonesia. The -2% change from 2012/13 to 2013/14 in the case of a surge shown in the table compares to -8% change in year-over-year producer price in the baseline without surging international prices. The baseline change in the Indonesia wheat producer price from 2012/13 to 2013/14 is +7%. The transmission of the price surge to these two commodities reflects real differences in the markets: the smaller market of mostly imported wheat is much more integrated with world markets as compared to the mostly domestic and much larger rice market.

Table 1. Effects of additional border measures in year of price surge

	No new policy		New border measures		Ratio	
	Rice	Wheat	Rice	Wheat	Rice	Wheat
Producer prices, percent change from previous year						
Argentina (export price)	89%	77%	35%	35%	0.4	0.5
Brazil	61%	77%	30%	32%	0.5	0.4
Chile	69%	75%	33%	34%	0.5	0.5
China	14%	4%	7%	2%	0.5	0.5
India	39%	14%	21%	11%	0.5	0.8
Indonesia	-2%	77%	-4%	34%	1.9	0.4
Russia	70%	68%	34%	32%	0.5	0.5
South Africa	77%	79%	35%	34%	0.5	0.4
Ukraine	74%	75%	34%	33%	0.5	0.4
Viet Nam	68%	80%	31%	35%	0.5	0.4
Simple average price	56%	62%	26%	28%	0.5	0.5
Consumer prices, percent change from previous year						
Argentina (export price)	89%	77%	35%	35%	0.4	0.5
Brazil	19%	19%	11%	11%	0.6	0.6
Chile	44%	15%	23%	9%	0.5	0.6
China	14%	4%	7%	2%	0.5	0.5
India	27%	8%	16%	7%	0.6	0.9
Indonesia	1%	17%	-1%	11%	-1.6	0.6
Russia	23%	10%	15%	8%	0.6	0.8
South Africa	49%	18%	25%	11%	0.5	0.6
Ukraine	47%	17%	24%	11%	0.5	0.6
Viet Nam	44%	18%	22%	11%	0.5	0.6
Simple average price	36%	20%	18%	12%	0.5	0.6

Source: OECD simulation results.

Upward pressure on the producer price leads to at least somewhat higher consumer prices.[12] In some cases, the increase in consumer prices is much smaller than the producer price increase. There are at least two possible reasons. First, large marketing margins diminish the capacity of raw commodity prices to affect final consumer prices. Second, outright consumer price controls can limit the potential for producer prices to drive consumer prices higher. Nevertheless, in these and other cases, the consumer price increase can be indirectly mitigated by restricting exports or encouraging imports to offset any increase in international prices beyond the trigger level. The consumer price increase is typically about half as much with the new border measures as would occur without this market intervention. However, this is largely determined by the threshold increase selected for the trigger mechanism to implement the additional border measures.

The presumed target of the adjustment in border restrictions on trade is domestic food use of rice and wheat. The level and percent change in wheat and rice food use in countries that respond to a price surge with border measures is consequently a critical test of the success of this policy (Table 2). The ratio of year-over-year changes, although complicated by positive and negative signs, gives an indication of how the new border measures alleviate the impact of the price surge on domestic food consumption (top half, right-most columns). The percent difference in food use between the two simulations is another way to assess how the new border measures affect consumption (lower half, right-most columns). The percent differences are zero or positive, suggesting higher food use as a consequence of these border measures, but in many cases the year-over-year change remains negative. This result is expected: the new border

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[12] The links in the model between producer and consumer prices are based on expert judgment and estimation in those few cases where there are sufficient data.

measures stop high price transmission onto the domestic markets to a certain degree, but do not eliminate it completely.

Table 2. Food use effects of a price surge with and without additional border measures

	No new policy		New border measures		Ratio or difference	
	Rice	Wheat	Rice	Wheat	Rice	Wheat
Food use per capita, percent change from 2012/13 to 2013/14						
Argentina	-7.7%	-14.7%	-1.7%	-6.8%	0.2	0.5
Brazil	-8.1%	-7.3%	-3.5%	-1.7%	0.4	0.2
Chile	-8.6%	-2.6%	-4.0%	-0.9%	0.5	0.4
China	-2.9%	-0.8%	-1.9%	-0.7%	0.7	0.9
India	-5.4%	0.8%	-2.0%	0.4%	0.4	0.5
Indonesia	0.7%	-0.6%	0.5%	0.8%	0.8	-1.3
Russia	0.3%	0.3%	0.6%	0.4%	2.0	1.5
South Africa	1.3%	2.0%	3.7%	1.8%	2.8	0.9
Ukraine	-7.9%	0.1%	-2.3%	0.5%	0.3	7.1
Viet Nam	-13.4%	0.9%	-6.7%	2.2%	0.5	2.4
Sum of these countries	-4.0%	-0.8%	-1.9%	-0.4%	0.5	0.5
Food use per capita in 2013/14, kilograms per person						
Argentina	9	104	9	114	7%	9%
Brazil	41	54	43	58	5%	6%
Chile	12	119	13	121	5%	2%
China	74	65	75	65	1%	0%
India	72	61	74	61	4%	0%
Indonesia	159	19	158	19	0%	1%
Russia	6	103	6	103	0%	0%
South Africa	17	64	17	63	2%	0%
Ukraine	4	124	4	124	6%	0%
Viet Nam	163	13	175	13	8%	1%
Sum of these countries	74	61	76	62	2%	0%

Source: OECD simulation results.

A complicating factor is that consumption of a staple grain depends not only on its own price, but also on competing or substitute grain prices in consumption. In general, wheat and rice can be substituted for one another to some extent, depending on the composition of national diets and dominance of established eating practices. It is expected that even the poorest consumers will try to maintain at least a minimum level of overall food consumption as prices rise, but will be quicker to substitute among similar foods, such as these two grains, if there is a change in relative prices.[13] As a consequence of cross- and own-price effects, consumers who want to keep buying staple grains tend to switch from rice to wheat in many of these countries – wheat consumption per person even rises in some cases.

In other cases, such as Viet Nam, there is a dominant staple grain.[14] Vietnam experiences large effects in absolute and relative terms. Rice consumption is the dominant staple in the absence of domestically produced or imported wheat and is also the key or dominant traditional food source. Therefore, an increase

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[13]   In other words, the model elasticities reflect the expectation that overall food demand responds to prices, but is inelastic, and demand for any particular food item is less inelastic (for grains) and potentially even elastic (for meats or dairy products).

[14]   Coarse grains are the most important staple in South Africa, on average. The coarse grain prices is not shocked directly in the experiment, but the higher rice and wheat prices cause coarse grain prices to rise as well, by 18% if there are no new policies, leading to its own set of consumption effects. Cross-effects with this grain can cause apparently large proportional changes in South African wheat food use or in even smaller rice food use

in the rice price is a setback for consumers who do not have the opportunity, ability or tastes to switch to alternatives, nor sufficient income to support the higher cost of food.

Who pays?

Border measures that truncate the link from world markets to domestic markets include export taxes or restricted export licenses for exporting countries and lower import tariffs for importing countries. In either case, there are implications for taxpayers. The approach followed here is consistent with the procedures for calculating transfers from consumers to producers caused by border measures estimated in the course of the OECD's annual monitoring exercise. In the OECD analysis, the fact that tariffs or export subsidies raise domestic prices is recognised as a transfer from consumers to producers. Taxpayers benefit from import tariffs and pay for export subsidies. If tariffs are lowered or exports taxed when international prices spike, then the transfer from consumers to producers is reduced or even reversed. Taxpayer effects are ambiguous, and so need to be calculated empirically by tallying up the different effects of this newly introduced policy to see which one dominates.

Table 3. Taxpayer effects of new border measure response to a price surge (USD million)

	Export tax		Import support		Net effect
	Rice	Wheat	Rice	Wheat	
Taxpayer effects, millions of USD					
Argentina	266	889	0	0	1155
Brazil	483	65	184	1022	-658
Chile	0	0	60	149	-209
China	1359	0	196	42	1121
India	1865	29	50	32	1811
Indonesia	161	4	53	669	-556
Russia	5	3183	48	97	3044
South Africa	0	23	407	210	-594
Ukraine	3	1563	46	2	1519
Viet Nam	3793	0	250	168	3375
Sum of these countries	7935	5756	1293	2390	10008

Source: OECD simulations.

Revenue to taxpayers from export taxes or licenses tends to outweigh any reduced revenues from lowering tariffs on imports in the ten countries (Table 3).[15] The effect varies substantially by country, with Vietnam's tax on its large volume of rice exports making many billions of USD for taxpayers. Russia gains almost as much revenue on wheat sales. Tax revenues of China and India also rise over USD 1 billion. Taxpayers in Brazil, Chile, Indonesia, and South Africa lose about USD 2 billion in revenues in the course of encouraging imports by lowering their tariffs.

Producers of rice and wheat in these countries also pay for these policies as intervention to lower domestic prices imposes a cost on producers.[16] Crop producers have very little capacity to respond quickly to a price surge. They can do little to increase production during a marketing year no matter how high their output price rises. As such, border measures that restrict the transmission of rising international prices to

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[15]   It is assumed that taxpayers collect the revenues from these market interventions, but this might not be the case. The taxpayer will not collect any of the revenue from restricted exports if the mechanism is export licenses that are given without charge rather than sold or auctioned.

[16]   This effect did not go unnoticed during the price surge. For example, producers in Argentina demonstrated in protest against export taxes.

domestic prices impose costs on producers in the sense that they receive less revenue than they would otherwise. Given the large amount produced in each country and the generally significant price effect of border measures, these costs total tens of billions of USD. Rice producers in each of China, India, and Vietnam lose USD 4-5 billion - or more - that goes to consumers and taxpayers. Russian wheat producers lose nearly USD 3 billion that goes to consumers and taxpayers in that country.[17]

Table 4. Producer cost of new border measure response to price surge

	Rice	Wheat	Total
Producer effect, USD million			
Argentina	-162	-917	-1079
Brazil	-1226	-768	-1994
Chile	-7	-168	-175
China	-5047	-280	-5327
India	-4312	-802	-5115
Indonesia	-171	0	-171
Russia	-11	-2974	-2986
South Africa	0	-186	-186
Ukraine	-7	-932	-939
Viet Nam	-4119	0	-4119
Sum	-15063	-7028	-22091

Source: OECD simulations. Calculated as the product of the change in price relative to the case without change in border measures times the level of production with the border measures in place.

Unintended consequences for other countries

Countries that use border measures to restrict the transmission of rising international grain prices onto their domestic markets no longer assist global markets to balance as prices rise. That makes international prices rise even more and requires consumers and producers in other countries to adjust more their buying and selling patterns.[18] As the ten countries in this experiment stop their exports to the world market, buyers will be forced to look to other countries for their needs. As some of these ten countries encourage further imports by lowering tariffs, even as the international prices rise, this will increase competition for the remaining supplies on world markets.

The price surge without additional border measures amounted to a 70%, year-on-year, increase in international rice and wheat prices. With border measures applied by the ten countries, the same shock to world markets causes a 134% increase in the international rice price and a 98% increase in the world wheat price. Thus, consumers in countries that do not intervene in markets pay a much higher price when these ten countries' actions drive world prices higher. However, producers in countries that do not intervene stand to gain more revenue as local prices rise all the more.

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[17]   It is not the intention to argue that any particular result is "fair". On the contrary, drawing hasty conclusions should be discouraged, and arguments based only on these numbers that producers do or do not deserve the windfall profit from an unexpected surge in prices are also rejected. For one thing, the assessment made of producer effects focuses only on crop markets. Because the potential of input costs are not considered in the analysis, such as fertilizer prices which may also be rising, the discussion is only of revenues on these commodities, not the amount that finally ends up as farmer income after taking into account the broader range of effects outlined in the OECD's work on decoupling. Here only the market effects are identified in terms of who benefits and who pays as consequence of the particular policy.

[18]   The implication of these new border measures is that world supply and demand elasticities with respect to world prices are lower. Less elasticity in world markets means that prices must rise higher to balance markets in the face of supply and demand shocks.

2.2. Consumer subsidies

Key facts about this policy scenario are as follows:

New consumer subsidies are additional to any consumer-oriented policies already in place.

The consumer subsidies are automatic mechanisms that stop further increases in the prices consumers pay once they have risen to a certain trigger level.

The policies are triggered if the consumer price rises by at least a certain percent. It is assumed that the trigger increase in annual average rice and wheat prices is 20%.[19]

The policies are not triggered by smaller price increases – or any other event – and are inactive unless consumer prices surge to this percentage increase.

Once triggered, the domestic price will go no higher regardless of any further increase in international and other domestic prices. However, the domestic price will have been increased already up to the trigger point.

All the ten countries covered by this analysis are assumed to provide this new consumer subsidy to support rice and wheat food use at levels of domestic prices 20% higher than in the preceding year.

Market effects

The consumer support policy response to a price surge targets consumer prices directly. The first question is whether a given surge in international prices causes internal consumer prices to rise enough to trigger the policy response. There are good reasons to expect that a one per cent increase in international prices causes less than a one per cent increase in consumer prices in most countries. For instance, there may be fixed margins owing to transportation, processing, marketing, and so on that are mostly unaffected by grain prices. Some countries regularly intervene in markets at the border using tariffs or TRQs or in their internal markets with some form of subsidy to consumers, in which case the transmission of world market price signals is lessened.

The analysis suggests that a new consumer subsidy is triggered more often for rice than for wheat (Table 5).[20] Setting a cap on the year-over-year increase in consumer prices of rice and wheat at 20% leads to subsidies in about half the cases overall. If the policy is not triggered, then the consumer price increase can be larger in this scenario because of the unintended consequences for world markets, as discussed below. In the presence of the 70% surge in world rice and wheat prices, the average per cent increase in consumer prices in these countries with the policy option in place is about one-half of what it would have been without the policy.

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[19]   The trigger is set lower than in the border policy scenario. This reflects the representation of consumer prices in most of the experiment countries in the model as explicit variables that do not typically move on a one-for-one basis with producer or border prices. Transmission to consumer prices is imperfect because of fixed margins that reflect the costs of processing and delivering goods, as well as the possibility that some consumers are physically or economically remote from markets.

[20]   The case of Argentina is a unique one. There, rice and wheat export prices are used to proxy domestic consumer prices. In practice, using producer or border prices as indicators of consumer price changes is acceptable as long as the elasticities of demand are adjusted to reflect the less than one-for-one relationship between relative changes in the indicator price and the real consumer price. The present analysis chooses to use the same trigger per cent increase in the proxy border price for convenience and clarity in exposition, but a higher trigger for this one case might be more appropriate given the model structure.

Table 5. Consumer price changes, with and without consumer subsidies triggered by price surge

	No new policy		New consumer subsidy		Ratio	
	Rice	Wheat	Rice	Wheat	Rice	Wheat
Consumer price changes, national currency units						
Argentina	89%	77%	20%	20%	0.2	0.3
Brazil	19%	19%	20%	19%	1.1	1.0
Chile	44%	15%	20%	15%	0.5	1.0
China	14%	4%	17%	5%	1.2	1.2
India	27%	8%	20%	7%	0.7	1.0
Indonesia	1%	17%	1%	18%	1.3	1.0
Russia	23%	10%	20%	10%	0.9	1.0
South Africa	49%	18%	20%	18%	0.4	1.0
Ukraine	47%	17%	20%	17%	0.4	1.0
Viet Nam	44%	18%	20%	18%	0.5	1.0
Simple average change	36%	20%	18%	15%	0.5	0.7

Source: OECD simulations.

Table 6. Food use effects of price surge, with and without consumer support

	No new policy		New consumer subsidy		Ratio or difference	
	Rice	Wheat	Rice	Wheat	Rice	Wheat
Food use per capita, percent change from 2012/13 to 2013/14						
Argentina	-7.7%	-14.7%	0.3%	-3.3%	0.0	0.2
Brazil	-8.1%	-7.3%	-8.8%	-7.3%	1.1	1.0
Chile	-8.6%	-2.6%	-3.3%	-2.6%	0.4	1.0
China	-2.9%	-0.8%	-3.3%	-0.8%	1.1	1.0
India	-5.4%	0.8%	-3.3%	0.5%	0.6	0.6
Indonesia	0.7%	-0.6%	0.7%	-0.6%	1.0	1.0
Russia	0.3%	0.3%	0.4%	0.3%	1.5	1.0
South Africa	1.3%	2.0%	9.7%	-0.9%	7.4	-0.5
Ukraine	-7.9%	0.1%	-0.6%	-2.0%	0.1	-31.6
Viet Nam	-13.4%	0.9%	-6.0%	-0.3%	0.4	-0.3
Sum of these countries	-4.0%	-0.8%	-2.9%	-0.8%	0.7	0.9
Food use per capita in 2013/14, kilograms per person						
Argentina	9	104	9	118	9%	13%
Brazil	41	54	41	54	-1%	0%
Chile	12	119	13	119	6%	0%
China	74	65	74	65	0%	0%
India	72	61	73	61	2%	0%
Indonesia	159	19	159	19	0%	0%
Russia	6	103	6	103	0%	0%
South Africa	17	64	18	62	8%	-3%
Ukraine	4	124	4	121	8%	-2%
Viet Nam	163	13	177	13	9%	-1%
Sum of these countries	74	61	75	61	1%	0%

Source: OECD Secretariat simulations.

The goal of the policy is presumably to maintain the level of consumption despite the price surge. Supporting consumption directly by limiting the increase in average prices to no more than a certain per cent increase limits the impact of a price surge on grain consumption (Table 6). For example, the price surge causes less than half the reduction in food use of rice in Vietnam with a consumer subsidy in place. The smaller price effect also means fewer consumers in Vietnam switch to wheat. The exact pattern of effects in each country depends on whether either of the two grain prices rise enough to trigger consumer price support, the magnitude of the subsidy, and the interaction between these two (and other) food commodities.

Who pays?

Interventions in the form of subsidies that target consumers do not directly affect border or producer prices. This policy does not cause any transfer from producers to consumers.

Taxpayers pay for consumer subsidies. The subsidy per unit is large in countries where the trigger is easily exceeded, and the overall expenditures are large in countries with a combination of high per-unit subsidy and a large volume of food use (Table 7). For example, the taxpayer bill is estimated to exceed USD 5.5 billion in India and is almost USD 3.5 billion in Vietnam. These two cases account for the majority of the total USD 10 billion dollars of taxpayer expenditures arising from this policy option.

Table 7. Taxpayer costs of consumer subsidy response to price surge

	Per unit		Total		
	Rice	Wheat	Rice	Wheat	Sum
Taxpayer effects	(USD per tonne)		(millions of USD)		
Argentina	224	88	89	434	522
Brazil	10	0	81	0	81
Chile	107	0	25	0	25
China	0	0	0	0	0
India	61	0	5658	0	5658
Indonesia	0	0	0	0	0
Russia	92	0	71	0	71
South Africa	208	0	194	0	194
Ukraine	142	0	24	0	24
Viet Nam	214	0	3469	0	3469
Average or sum	106	9	9611	434	10044

Source: OECD Secretariat simulations.

Unintended consequences for producers and for other countries

The consumer subsidy response to a price surge protects the targeted consumers from the effects of rising prices beyond a certain amount. As a result of the subsidy, consumers are able to maintain their consumption despite the higher market prices. As these consumers no longer reduce their consumption, world markets must balance by bidding prices higher and drawing in more supplies from producers, more out of stocks, or reducing consumption in other places.[21]

The world rice price increase is exacerbated by a new consumer subsidy put in place in the ten countries. The world price spike is some 2-3% higher than it would be without this policy.

2.3. Public stocks

Key facts about this policy scenario are as follows:

The public stocks are additional to any other public stocks held under existing programs. This policy relates to the incremental increase above existing stocks.[22]

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[21]   These higher prices were noted before, as observed for the consumer prices for country-grain combinations where the consumer subsidy were not triggered.

[22]   The increase in public stocks for the purpose of alleviating future price surges might have as an unintended consequence of a reduction in other stocks. If buying up public stocks increases the current price and decreases the likely value of private stocks in the future by reducing price spikes, then some private stocks will be displaced.

The public stocks are automatic mechanisms that build if prices are not increasing very much until a target share of consumption is achieved, and begin to be sold off if prices rise beyond a specified trigger price. The following rules were applied to represent public stock holding policy:

- o Public stocks are 33% of consumption as long as the domestic price increases by no more than 20% year- on-year;
- o Public stocks are completely run down if the domestic price increases by at least 40%; and,
- o Public stocks will be a declining percent of consumption as the domestic price rises from the point of maximum stock-holding to the point of complete stock sell-off.[23]

Public stock holding implies taxpayers' costs during the building or acquiring phase from the market. It is assumed that there is also a carrying cost of stocks of USD 36 per tonne.[24]

Public stocks take on a high value during a price spike, but it is not clear who captures the benefit. If public stocks are sold at market prices, then the taxpayer gets the revenues. If public stocks are given to consumers, then consumers get the benefit.[25] As no presumption is made as to which option would be chosen, the benefits are estimated separately.

All the ten countries covered by this analysis are assumed to accumulate new public stocks of rice and wheat for the purpose of this policy experiment.

This analysis omits certain potentially important factors. We include carrying costs, but ignore the costs of rotating stocks routinely to prevent spoilage. We do not consider the response of private agents, as discussed again later, so we do not consider any possible effects of a given level of public stocks on private stock-holding or the implications of new public stocks for market operations and price formulation.

Market effects

The additional public stocks are to be released specifically to limit price surges. They are added to any existing public stocks held for other purposes and increase the availability of grain supplies at the time that tight markets would lead to a price spike. Owing to the large share of world use of wheat and rice that takes place in these ten countries and the assumed size of the public stocks accumulated by each country, the release of stocks has the effect of sharply limiting the increase in world prices. The surge in the international rice price is reduced to a 43% increase even though the same external shock would normally lead to a 70% rise in world rice prices. The wheat price surge is all but eliminated: the increase is reduced to about 36%, a price change that might not merit being called a price "spike" or "surge" at all.

Food use in most of these countries is higher than it would be in the scenario without a new public stock policy. The exceptions are those country-commodity combinations that are not well integrated with world markets and where there are lagged effects owing to the initial build-up of these public stocks. For most countries, the larger stocks held in these ten countries help domestic consumers.

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[23]   The exact formula for this range of prices is (*current price / last year's price* - 1.4)/(1.2-1.4).

[24]   The annual cost of storage per tonne of grain is based on Canadian Grain Commission "Licensed Primary Elevator Tariffs 2008-09" August 2008.

[25]   Releasing public stocks of unprocessed wheat and rice to consumers might be undertaken by distributing the stocks among processors in the country, possibly with some instructions to discount prices to consumers. If so, then the benefits would be split between processors and final consumers. Other options for releasing stocks without charge might target the final consumer more directly, such as selling grains and issuing the proceeds as coupons that consumers can use to buy final food products.

Table 8. Food use effects of price surge with and without change in public stock policy

	No new policy		New public stocks		Difference	
	Rice	Wheat	Rice	Wheat	Rice	Wheat
Food use, kilograms per person						
Argentina	9	104	9	113	3%	8%
Brazil	41	54	43	57	4%	5%
Chile	12	119	13	121	5%	1%
China	74	65	76	66	3%	2%
India	72	61	74	60	3%	-2%
Indonesia	159	19	156	19	-2%	1%
Russia	6	103	6	103	0%	0%
South Africa	17	64	17	64	-2%	0%
Ukraine	4	124	4	124	5%	0%
Viet Nam	163	13	173	13	6%	1%
Sum of these countries	74	61	76	62	2%	1%

Source: OECD simulations.

Costs and unintended consequences

Taxpayers pay to build up the buffer stocks of wheat and rice. A new public stock policy drastically reduces the price surge, but requires that taxpayers finance the purchase and maintenance of sufficient stocks to reach the target level of consumption of 33% assumed in the analysis in the years preceding the price surge. For each tonne, they pay the going market price.[26] The implication is a potentially large investment or expense to have on hand the size of stocks required to reduce dramatically the effects of a price spike (Table 9). Even maintaining stocks of this magnitude once they are acquired imposes a high cost on taxpayers. For countries with a large total consumption of grains, especially China and India, the ten-year cost of holding these stocks is measured in tens of billions of USD.

Table 9. Taxpayer costs of building up stocks to buffer against price surge (USD million)

	Rice, annual average		Wheat, annual average		Total cost
	2010-12	2014-19	2010-12	2014-19	all years
Taxpayer costs, millions of USD					
Argentina	21	13	185	123	1441
Brazil	704	212	523	319	6985
Chile	10	6	145	62	886
China	14542	1608	3015	1317	73552
India	4043	1451	3315	1188	42604
Indonesia	2282	560	227	135	12236
Russia	14	11	1163	677	7878
South Africa	58	35	145	78	1297
Ukraine	9	5	314	218	2341
Viet Nam	1628	735	47	34	9694
Total	23311	4636	9080	4149	158913

Source: OECD simulations. Costs include carrying cost of $36 per tonne per year.

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[26] The stocks could be built up through purchases at world prices, if these are lower because of barriers to trade. Stocks could also be built by requiring producers or consumers (e.g. mills) to contribute and thereby shift the costs to other agents.

Nevertheless, benefits are recorded when these stocks are released.[27] For Vietnam, the value of released stocks assessed at the 2013 market price is about USD 3 billion. The value of stocks released by Brazil is worth USD 1.5 billion. If the government sells stocks, then the taxpayers benefit. If the public stock policy mandates that stocks are given to consumers at no charge when prices spike, then the taxpayer does not benefit. The mechanism of releasing stocks during a time of high prices determines who benefits directly, although the broader effect of reducing market prices will affect all agents who buy and sell at those prices.[28]

Releasing the additional public stocks during a price spike benefits consumers and reduces producer revenue. Conversely, producers benefit and consumers lose during the stock buy-in phase. The effort to hit the target level of stocks in a sense spreads out the price spike: prices are bid higher as stocks are purchased and prices are lowered or do not surge as high, when the stocks are released than would be the case in the absence of such stocks.

Stocks before the surge and stocks without a surge

A public stock policy that requires building and holding stocks to be released in the event of a price surge affects markets and costs taxpayers whether there is a price surge or not. Whereas the border measure and consumer subsidy policies discussed above are only activated if prices rise beyond some trigger level, the public stock policy not only has an effect in normal times, but also in the acquisition phase.

World prices are higher as a consequence of the effort to build up sufficient public stocks that can suppress in part a price surge (Figure 4). Before the price surge, world prices are as much as 20% higher than they would be without this policy in place in the early years as public stocks are purchased. The price effect vanishes eventually as there is little net change once stocks are built up to the target level.[29] Consumers in the countries that are building stocks as well as all other consumers who buy at prices that are influenced by international markets pay more in the initial years of the projection period in order to pay less in the fourth year if there is a surge, and simply pay more to build stocks without any benefits if there is no surge. Producers gain from the stock-holding policy during the initial acquisition phase through higher market prices.
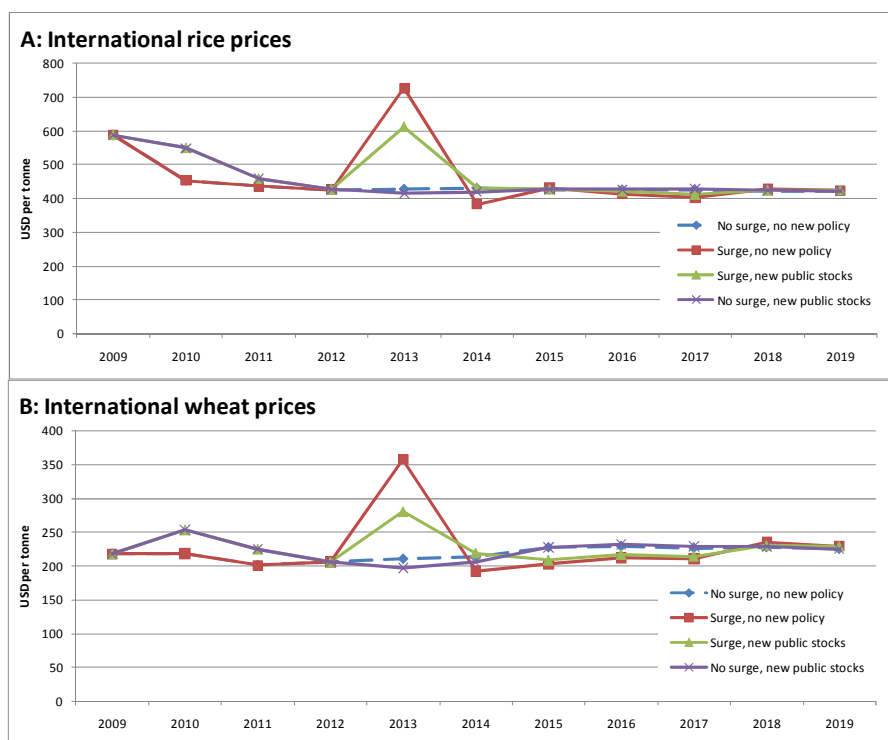
Taxpayers pay for a new stock policy even if the stocks go unused. There are costs associated with acquiring and storing these buffer stocks, even if there is no occasion to release them. Total taxpayer costs of this new stock policy are almost as large, even if the stocks are bought and held, but there is no price surge that gives reason to release – and rebuild – the stocks. Unlike the preceding two policy options discussed here, the new public stock policy entails market intervention and taxpayer cost with or without a price surge.

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[27]   In the case of China and India, the wheat price spike is no longer so severe that stock release is triggered in 2013.

[28]   It is assumed that the stocks are released in a way that they affect commercial sales. It is theoretically possible that their release would be targeted to consumers whose grain use is in no way tied to the wider markets. However, it beggars belief that a policy that is introduced expressly to limit the impact of surging market prices on consumers would target consumers for whom market prices do not matter at all.

[29]   The carry charge taxpayers must pay to hold the stocks is assumed not to affect commodity markets. We also assume that privately-held stocks are not displaced by the presence of these new public stocks.

Figure 4. Grain prices with and without price surge and new public stocks

A: International rice prices

- No surge, no new policy
- Surge, no new policy
- Surge, new public stocks
- No surge, new public stocks

B: International wheat prices

- No surge, no new policy
- Surge, no new policy
- Surge, new public stocks
- No surge, new public stocks

Source: OECD Secretariat simulations.

3. Study limitations

It is assumed in this analysis that the price shock is a transitory event, lasting one period only. However, the effectiveness of these policies becomes even more questionable if judged on how they handle *a permanent shock*. All of these policies fail in some way if prices remain high or continue to rise:

Border measures might be maintained indefinitely, if consistent with international agreements, but that leads to on-going losses in tariff revenue or receipts from export taxes. They would also suppress domestic prices and the response from domestic producers and consumers, forcing international prices to be even higher and for a longer period of time.

Subsidies to consumption could be continued, but only at considerable taxpayer expense.

Consumer subsidies or border measures could be phased out to lessen the long-term distortions and taxpayer effects, but doing so would allow the full effect of international price changes eventually to be transmitted to domestic consumers.

The release of public stocks would be a one-off measure to help the transition, but could not provide a permanent buffer against higher prices once the stocks become fully depleted.

There are several *practical aspects* to the implementation of such policy options that the analysis tends to overlook, but that would warrant further attention. Administrative costs are generally ignored in the analysis, for example. If consumer subsidies are targeted instead of blanket price caps, as were represented in this analysis, then the costs could be quite high and perhaps even unmanageable for less

developed countries.[30] Public stocks require facilities in which to store the grain and maintain it in a useable condition, which would constitute a significant up-front cost to have on hand and then maintain a significant quantity of grain relative to domestic use.

The practical mechanism for a new consumer subsidy could have critical distributional effects that were ignored in the current analysis. This policy could allow public agents to purchase rice and wheat at one price and sell these commodities at a lower price to all buyers, or to give some type of certificate for a subsidy that applies to all purchases. However, consumer subsidies might instead attempt to target vulnerable consumers. No attempt has been made to assess the scope for distributional effects from such an effort and the taxpayer costs of developing mechanisms to target vulnerable consumers have not been calculated.

Private agents will respond to prices and expected prices that result from the policies. Many of these effects are automatically tracked in the model simulation. Border measures that suppress domestic prices also suppress national supply response. Public stock policies that raise prices when prices are low through stock acquisition and lower prices when they are high (through stock release) will tend to discourage private stockholding, so public stocks displace or crowd out some private stocks. Consumer subsidies in one country might lead to cross-border transit of goods by consumers to take advantage of relative prices. Private agents might find ways to circumvent border measures that cause a sharp difference in prices. Clearly all the possible ways that private agents could possibly respond are not represented in the analysis.

It is further assumed that *other countries are passive* even though the policies implemented by the selected group of ten countries can have negative consequences for consumers around the world. The implications for total rice and wheat food use in other countries are uniformly negative from all these policy options.

4. Summary

These policy options examined here do help the ten countries included in the analysis to sustain domestic grain consumption if there is a price surge (Figure 5). Grain consumption is higher in the year of the hypothetical price surge (left-hand side) and usually higher on average for the projection period (right-hand side). In the case where there is no new policy implemented in these countries, their total rice and wheat food use is 2.4% lower in 2013/14 if there is a price surge relative to the case of a no price surge situation.

New policies that use border measures, consumer subsidies, or public stocks to reduce the impact of a price surge work in the sense that the consumption effect of a price surge in 2013/14 is less negative relative to a case without a price surge for the group of ten countries in all cases. If averaged over the entire period, these ten countries' collective policies to suppress world market price transmission would effectively erase the reduction in consumption over the period (right-hand side of Figure 5).

Consumer subsidies would actually increase food use slightly (0.1%) over the period relative to the case without a price surge. With the consumer subsidy, producers respond to the higher prices induced by the price surge, so grain supply is higher in subsequent years. Consumers benefit from the subsidy during the price spike, and then benefit from lower grain prices. Thus, consumer subsidies seem to be effective in

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[30]   This point was made during the OECD Global Forum on Agriculture of 2009. The price shock of the 1970s induced some policy makers to outline mechanisms to target specific types of consumers and developed processes to identify these consumers quickly, but these efforts proved too expensive to be continued for long or perhaps even to be introduced completely.

dampening negative impacts on consumers while not distorting incentives for producers, but a subsidy to all domestic food use has high taxpayer costs.[31]

The stock-holding policy reduces food use over the period by more than the price surge, if judged by the average effect. Instead of a sharp one-time drop, there is sustained pressure on food use as consumers compete against public stock purchases whenever stocks are being built up. This pressure is present during an initial build-up period with or without any price surge, so that food use averages 0.9% lower than it would without a stock policy even if there is no price surge. If there is a price surge, then the magnitude is lower because of stock release. After the surge, consumption is lower as stocks are rebuilt. The average effect is 1.1% less food use as compared to a base case with no price surge and no new policy in place. Still, these policies tend to benefit grain consumers in the ten examined countries.

Figure 5. Total food use of wheat and rice in ten countries that introduce new policies, per cent changes from baseline without price surge
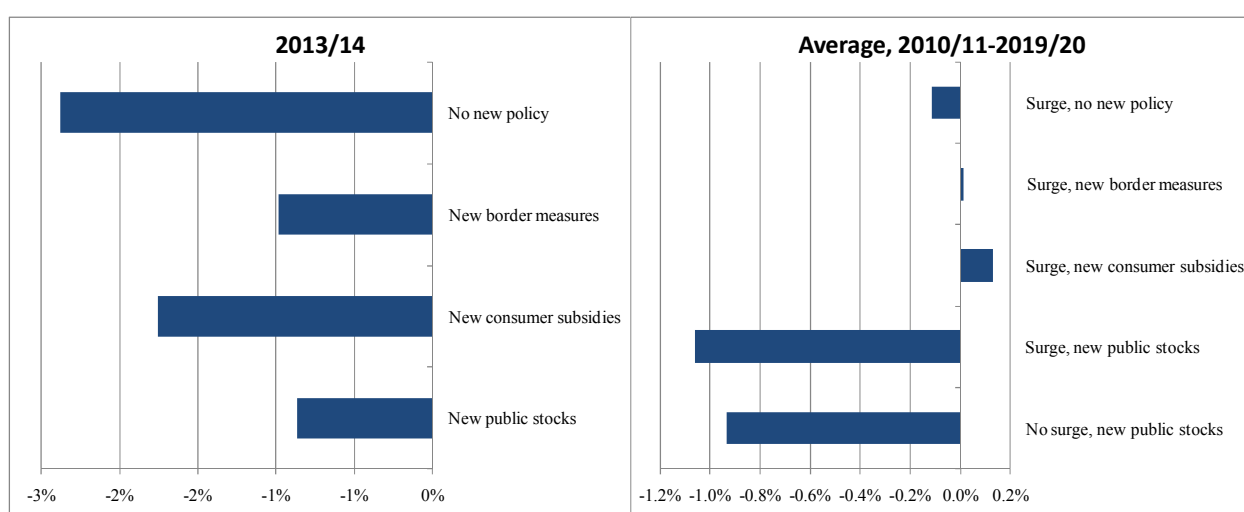
Effects of new policies in these ten countries on other developing countries

Implementation of these policy options in the ten countries examined often have negative consequences for other developing countries.[32] Other developing countries, many of which are low income countries, would see total rice and wheat food use fall by 3.9%, in the event of the price surge scenario relative to the case without a price surge and if there was no new intervention in grain markets (Figure 6, left side).

If the group of ten countries introduce new border measures and consumer subsidies of the type described in the scenario analysis above, then the price surge would cause a larger decrease in rice and wheat food use in other developing countries. Policy interventions in some countries cause more price adjustment and a bigger decrease in consumption for other countries that do not intervene. Instead of rice

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[31]   For a more detailed discussion on distributional effects of high food prices and on fiscal costs of various policy measures applied by emerging economies see "Policy responses in emerging economies to international agricultural commodity price surges" (Jones and Kwiecinski, 2010).

[32]   These data sum rice and wheat food use for Bangladesh, Colombia, Algeria, Egypt, Ethiopia, Ghana, Islamic Republic of Iran, Mozambique, Malaysia, Nigeria, Pakistan, Peru, Philippines, Paraguay, Saudi Arabia, Sudan, Thailand, United Republic of Tanzania, Uruguay, Zambia, and Haiti and most other NMEs in regional aggregates. About one billion people live in the countries listed above and over one billion more in the regional aggregates.

and wheat food use falling by 3.9% in other developing countries in the event of a price surge, the new border measures would cause consumption to be 5.6% lower and new consumer subsidies would cause consumption to be 4.2% lower. Thus, policy interventions by the ten countries discussed in the scenario analysis above that sever price transmission tend to exacerbate the effects of a price surge in other countries.

Figure 6. Total food use of wheat and rice in other developing countries that do not introduce new policies, per cent changes from baseline without price surge
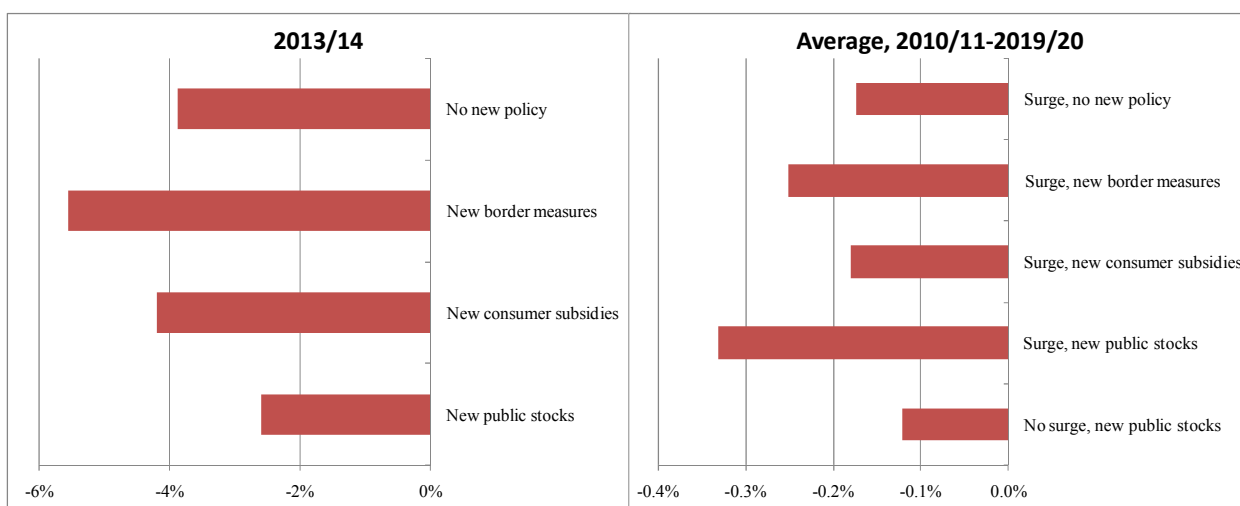
The global effects during a price surge are alleviated if the ten countries introduce a new public stockholding. The release of these stocks relaxes a tight market situation and lowers prices for all consumers. Instead of a 3.9% decrease in rice and wheat food use in other developing countries if there is a price surge, the reduction is only 2.6% with the new public stock policy.

The long-term effects of all these policies on rice and wheat food use in other developing countries are negative, or at best nearly neutral. Considering average rice and wheat food use over the period, the new policies in the ten countries analysed above always cause consumption to be lower in other developing countries than it would have been without the policies. With the price surge and no new policies, rice and wheat food use in other developing countries would be 0.2% lower over the period (Figure 6, right side). If the ten countries introduce border measures, then rice and wheat food use in other developing countries would be 0.3% lower over the period. The new consumption subsidy causes a small further decrease in consumption as compared to the effects of the price surge alone.

Rice and grain food use in other developing countries is also lower if the ten countries buy up new public stocks. The price surge and new stock policy combined cause food use in other developing countries to fall by more than 0.3% as compared to the 0.2% reduction caused by the surge without the new stock policy. The new stock policy also has a negative effect if there is no price surge. In that case, the new stock policy leads to 0.2% lower rice and wheat food use in other developing countries.

In terms of their effects on wheat and rice food use in other developing countries at the time of the surge or over a longer period, all these policy options have negative unintended consequences.

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