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ORIGINAL PAPER

Grain import dependency in the MENA region: risk management options

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Abstract The Middle East and North Africa (MENA) Region is the largest grain importing region in the world. Severe constraints on arable land and water, coupled with a growing population and rising incomes, make the region inherently dependent on imports to meet rising demand for food, particularly cereals. These imports became exorbitantly expensive in recent years as world market prices for cereals were high and erratic. As a result, MENA countries, as well as food importing countries throughout the world, have placed a new premium on designing strategies for improving food security by reducing the risks that accompany being a food importing nation. This paper is meant to be an overview of strategies available to policy makers in the region in order to improve food security under the assumption of continued import dependence.

Keywords Grain imports · Import dependence · Risk management · Food security · Middle East · North Africa

Background

The majority of countries in the Middle East and North Africa (MENA) Region are inherently not food self-sufficient, that is, they do not produce enough food to meet domestic demand. In the absence of the ability to produce more food, they are reliant on imports from countries that are in surplus. This is especially true of cereals; MENA countries are the largest net-importers of cereals in the world (World Bank 2009). Traditionally, the major risk that was foreseen in importing from other countries was that the price of this food might increase and that the importing countries would be unable to manage this risk. The events of 2008 highlighted these risks, which were realized due to a number of external factors. Not only did the international prices for food increase dramatically, but the availability of some foods was temporarily blocked due to a decrease in global production and/or export bans placed by exporting countries. These exporting countries had suddenly found themselves in a position of food prices spiraling upwards (largely due to contagion from the international markets) and a requirement to create domestic oversupply to hold down internal prices by restricting exports (Mitchell 2008; Dorosh 2009; Wright 2009). The effect of the export bans left many international trading companies in a position of not being able to fulfill near-term supply contracts and there was widespread default on deliveries. It should be noted that, in general, these companies were able to fulfill long-term supply contracts because they had secured stocks well in advance of the temporary bans and either held them in offshore storage or they were already in transit.

The immediate effects of the shortages and price spikes have caused many governments (not only in the MENA region) to consider the issue of domestic food security in much more detail than previously. Even the United Kingdom has recently produced a paper considering issues related to this subject (DEFRA 2008). International debate continues as to the potential global responses to the ‘food

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crisis' and means of ensuring that the situation does not arise in the future. However, for sovereign governments, while joint action and global plans are clearly strategically important for them in the medium to long term, they continue to search for means to address the issue in the immediate future.

Outline of the paper

A number of food security strategies, individually or in combination, are being considered or implemented in different countries. This paper will not attempt to discuss or evaluate all these. It will only consider issues relating to bulk grain imports, not other types of food commodities (although they are also important). The paper will consider the tools at the disposal of governments, parastatals and private sector companies for managing their relations with the international grain trade, specifically in respect to performance and price risk (which were the main problems in 2008). These risks are prevalent even if (and perhaps especially when) a decision is made to maintain expanded physical grain stocks, as silos still need to be filled, rotated and replenished, the supplies for which need to be procured from the international markets. It should be noted that the paper will mainly consider physical risk management options, as opposed to financial ones (which will be discussed and explained in more detail later in the paper).

This paper is not academic in nature, nor is it designed to provide a 'how to' guide and best efforts have been made to avoid the use of technical terminology. The paper is targeted at non risk management practitioners, policy makers, procurement agencies and commercial purchasing units and seeks to provide an introduction to the main risks, explain the correlation between different risks, and give an overview of the potential tools and strategies that are available to manage them. It should be noted, however, that the use of these tools and strategies requires a deeper understanding of them than it is possible to provide in this short paper. In addition, the tools themselves need to be managed in relation to a continually changing market and therefore any government or organization seeking to make use of them should seek the services of professionals in the field.

In essence, the paper outlines how, through the use of various tools and approaches, it would be possible for grain importing governments in the MENA region to reduce the risks of grain unavailability and also reduce their exposure to the price, performance and financial risks involved with imports.

Given the marked differences in terms of import volumes and logistics challenges between the countries in the MENA region, it is not possible to draw clear conclusions for the region as a whole. Indeed, certain approaches and strategies may not be useful or available to certain countries, while highly applicable to others. This paper is therefore specifically not prescriptive, nor does it seek to evaluate or compare the different strategies, as the results will be different depending on a given country's attitude to risk, financial and/or logistical resource availability and the extent to which they are food insecure. Readers familiar with the specific challenges facing certain countries in the region, however, will be able to make connections between the strategies discussed in this paper and the needs of the country in question. The tools and strategies outlined in this paper could help stakeholders in each country to review their procurement profile.

Risk management in a food security context

Risk—the possibility of the realization of an event (normally negative in nature)—is pervasive throughout human existence. To avoid or minimize these potentially negative outcomes, individuals and governments alike engage in risk management (RM) continuously. Effective RM relies on two initial steps—risk identification and quantification. Risk identification requires that a proposed action or activity is considered in the light of recent events and history that might affect what is planned. The risk can be *direct*—an event or action of a third party that directly affects the planned activity, or *indirect*—the event or action directly affects another variable, but that in turn then has an effect on the proposed action. Quantification of the risk (i.e. the loss that would be suffered should the event occur) and the likelihood of it occurring are normally calculated in monetary terms—either the extra cost incurred by the realized risk or the cost of replacing or repairing what was affected by the risk. The likelihood is based on the number of times the risk has materialized itself, or is projected to materialize, over a given previous period of time. Having completed the identification and quantification steps, the party at risk is now in a position to be able to not only consider what steps to take to manage the risks, but also to be able to evaluate the potential losses of a negative event *ex-post* versus the costs of managing the exposure *ex-ante.*

In the context of import related food security, the main risks that a government faces are:

a) *Availability risk*—The risk that grains may not be available for import, potentially because of crop failures in producing countries or due to there being barriers to import (physical or political).

b) *Counterparty performance risk*[1]—The risk that, despite grains being available at an acceptable price, the party who contracted to deliver the grain defaults on the contract.
c) *Price risk*—The risk that the price of imported grains will increase above levels that the importing country considers to be acceptable and/or may be able to afford.

We shall consider these risks and their drivers in more detail in the following section. World Bank (2009) provides an explanation of how price and availability risk differentially affect different types of countries in the MENA region.

Having identified and quantified the risks governments need to develop a risk management strategy and identify resources required to implement it. There are three broad approaches to managing risks and it should be noted from the outset that a risk management strategy may use all three, a number of them or only one. The main approaches are:

a) *Mitigate*—Mitigation can be better understood as 'avoidance' or 'reduction'. Having identified a risk and decided that it is highly likely to happen and that the losses will be high, an actor may decide to either do something else or do the same thing in a way that does not incur the risk. For example, a country may seek to mitigate availability risk by increasing the size of its grain stockpiles.
b) *Transfer*—Transferring a risk involves passing the risk to a third party, who will agree to do this because they will charge you a fee for taking or assuming your risk. Perhaps the best known example of this is insurance. The amount of the fee (normally known as a premium) is largely dependent on the likelihood of the risk materializing and the expected value of the loss should it materialize. For example, a country can seek to transfer its price risk by purchasing grain on a fixed price, forward purchase contract. In this case the price risk passes to the party contracting to deliver at the fixed price (which may contain a price premium, depending on the markets).
c) *Cope*—Coping is a strategy normally based on a decision that it is not possible to either mitigate or transfer a risk. The actor simply reacts to the realized risk as and when it occurs (i.e. after the event or *ex-post*). While this may seem the least attractive option and leaves the actor exposed to a risk, it is possible to take measures prior to the event (*ex-ante*) by doing such things as making financial provision or investing in assets that will be used to address the realized risk. An example of this would be where a government uses a social safety net or subsidized bread program to reduce consumer prices at a time when market prices are higher than an acceptable level. The financial resources to fund these programs may have been earmarked or set aside on an *ex-ante* basis, or less desirably, diverted from funds earmarked for development and social goals.

Risk management strategies often use more than one approach. For example, a government may increase the size of its stockpiles to a level which would ensure their grain supply during a period of unavailability (mitigation); seek to protect itself against price risk for the stocks that they would then rotate through this stockpile by entering into forward fixed price contracts (transfer); ensure that the forward contracts were concluded with a number of suppliers with the provision of performance guarantees to manage the counterparty risk (mitigation) and set aside financial resources in periods of lower prices to provide for periods when prices rise or more expensive spot purchases are required to address contract defaults (coping).

It should be noted that an actor often faces a number of related and non-related risks for each action and that managing one risk may still result in loss if another risk is realized. For example, transferring counterparty risk may result in a financial payout in a case of contractual default, but this will not address food security if there is also a problem with grain availability. It should also be noted that transferring a risk can result in the increase of another risk unless that is properly managed. For example, a government can transfer its price risk through the use of a fixed price forward contract, but in so doing may well increase the risk of the counterparty defaulting if the market moves against them and they have failed to manage their own price risk.

Typology of import risks to food security

As mentioned above, the main risks to be considered in this paper are those of physical grain availability, price and counterparty risks (contract performance risk). The scenario considered in this paper is where a government has already taken the decision to increase physical stock holdings through expanded storage facilities. This paper does not address risk management to avoid contingent liabilities, such as a country which produces wheat, which then has to import when there is a crop failure. The management of

[1] Pure counterparty risk is normally a reference to actions or inactions of a counterparty based on volition. There is another side to performance risk and that is where the action or inactions of the counterparty is not due to their own volition, but due to the actions or inactions of a third party. For example—an export ban. The counterparty wants to perform but cannot due to the actions of a third party—in this case a government.

agricultural production risks is a complex issue and will not be dealt with explicitly in this paper.

Physical grain availability can be affected by a number of factors, the main one being a fall in production of grains in the main exporting markets. This is invariably caused by adverse weather or pest infestation events. Historically, such events did not have a major impact on actual availability, due to the existence of global carryover stocks. Global stocks have been declining over recent years (see Figs. 1, 2 and 3 on global production, consumption and ending stocks for wheat, maize and rice).

As is seen, while production of rice, maize and wheat has expanded strongly, so has consumption, and therefore stocks have not expanded. However, in absolute terms, it would not appear that global stocks varied enormously. They are, in fact, currently at almost period highs for both rice and wheat. However and perhaps most importantly, stocks have failed to expand as a ratio of consumption. Although there was a tendency for growth in the period from 1972 to the late 1980s and then a flattening through the 1990s, a marked drop in ratios is seen since the beginning of 2000 in rice, maize and wheat. This is arguably the major factor affecting both availability and price volatility on an annual basis (Fig. 4; Wright 2009).

Counterparty (performance) risk is the risk that a counterparty in a grain purchase contract will default and fail to deliver and is driven by both commercial and non-commercial factors. Commercial factors include such things as the inability of the counterparty to deliver the contracted grains at the agreed price (especially if it was agreed in advance of the time of delivery); inability to secure freight at rates which will enable performance within the contract price; inability to access the trade finance necessary to execute the trade (or inability to find it at competitive rates), etc. Non-commercial factors that may negatively impact contract performance are such events as export bans in exporting countries (as per 2008); and natural disasters or civil conflicts that do not enable the counterparty to either export the grain, deliver it to the buyer or ship it through a transit route. Recent examples include the Asian tsunami, the Gulf Wars (Reuters 2003; Simhan and Raja 2003), and piracy off the coast of Somalia (Philp 2008; Guled 2009).

Price risk can be a major factor that affects both parties to the transaction and is one of the most common risks faced in the trade of agricultural commodities. In the past 20 years or so, prices for grains (in constant 2000 US Dollar terms) have been at all time lows (Fig. 5), reflecting a general decline in the price of agricultural commodities. However, since the beginning of 2000, there have been marked increases in both the prices and price volatility of wheat and maize, especially when one views them on a monthly, as opposed to annual average basis (Fig. 6). For rice, the picture is even more dramatic in terms of the increase in price (Fig. 7). It is notable that the price increases post-2000 coincide with the decreases in stocks to use ratios. Arguably, the removal of programs to incentivize excess production in Western countries and an apparent slowing of yield growth potential are drivers of this situation and that this is causing prices (and price volatility) to rise. This culminated in the price shocks of 2008 and it is widely believed that this situation will continue to persist for the foreseeable future. With a growing world population, adverse impacts of climate change on agriculture and competing pressures on agricultural produce for alternative uses (such as fuel), the overall prognosis is for prices to rise.

Food security risk management strategies

This section presents some of the specific tools available to MENA countries and evaluates them along two dimensions. The first dimension is the type of risk the strategy helps manage, that is physical availability risk, price risk and counterparty risk. The second dimension is the type of risk management the tool provides, that is mitigation, transfer or coping. In many instances these tools help manage multiple types of risk (most notably both physical availability and price risk) (Dorosh 2009). Because of the links between global supply and world market prices, it is impossible to completely detach price risk from physical availability risk. Concretely, if supply is low there a possibility that an importer will not be able to secure ample physical grains. However, even if the importer can get the quantity desired, the cost may be extremely high. Therefore

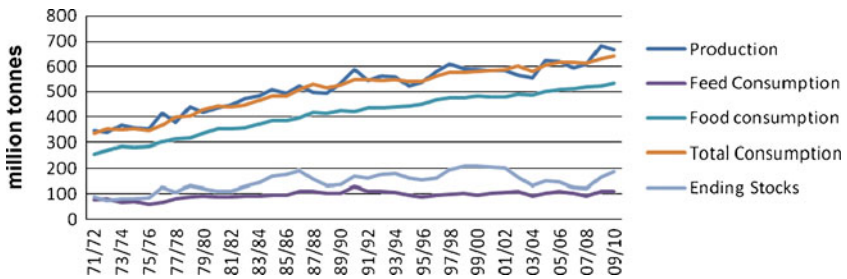

Fig. 1 Global statistics for wheat, 1971–2010 (data from USDA Production, Supply and Distribution Online website http://www.fas.usda.gov/psdonline)

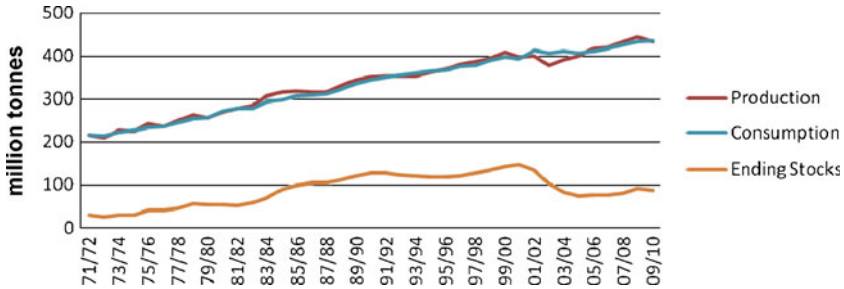

Fig. 2 Global statistics for milled rice, 1971–2010 (data from USDA Production, Supply and Distribution Online website http://www.fas.usda.gov/psdonline)

a strategy like stockpiling protects the importing country from both physical availability risk and price risk. A strategy like using financial instruments (futures and options) might protect an importer from price risk, but it does not ensure the ability to secure physical grains. There is also overlap between counterparty risk and physical availability risk, and between counterparty risk and price risk. An exporter may ban exports, impeding the importer from obtaining the physical grain. Alternatively, an exporter may impose a tariff that increases the price for the importer. The sections that follow are organized by the type of risk a strategy is primarily designed to manage, but many of the strategies help manage multiple types of risk.

Physical availability risk

Stockpiling: advantages and disadvantages

The most obvious way to manage the risk that grains will not be available is to ensure that you have enough grains stockpiled to supply the domestic market during a period of unavailability (mitigation). Coupled with measures to shield domestic stocks from global markets, stockpiling will also help mitigate price risk as the stockpiling country can essentially sell the stored grain to itself at a price lower than global markets dictate. Stockpiling has a long history in the MENA, but the recent food price crisis has renewed interest in parts of the region (Karam 2008; Kawach 2010).

The primary strategic decision to make is how large the stockpile should be, and this amount depends largely on the goal that motivates stockpiling (mitigating physical availability risk versus price stabilization). Models used to determine optimal stock sizes for price stabilization are complicated, dynamic and stochastic in nature, and must take into account interest rates and demand (see Brennan 2003). However, in practice it is more common that institutional limitations and uncertainty over risk parameters lead to simple rules of thumb being used (Dorosh 2009). Estimating the size of physical stocks required to mitigate physical availability risk is more straightforward, yet highly political. This calculation might average per capita consumption by month times the number of citizens to be supported and the number of months that it is perceived that it will not be possible to purchase new stocks.

While it is possible to see that there are certain advantages to using grain stocks as mitigation, there are also disadvantages. First, stockpiling is costly. The base cost of storage, including loss to pests or spoilage, is estimated at around 2% for wheat in developed countries, but the cost can be higher in developing countries. For instance, in Bangladesh the cost of storage is estimated at 6% of the value of the grain. Much of this difference is due to higher interest rates and high demand elasticity (Brennan 2003). In addition to these base costs, it is extremely important to be able to track the replacement value of the stocks. Each new delivery to the storage and release from it (either to the market or a bread program) will have pricing cost, either implicit or explicit. Failure to track these and to make financial provision for either the shortfalls or surpluses can lead to an inability to manage the real costs

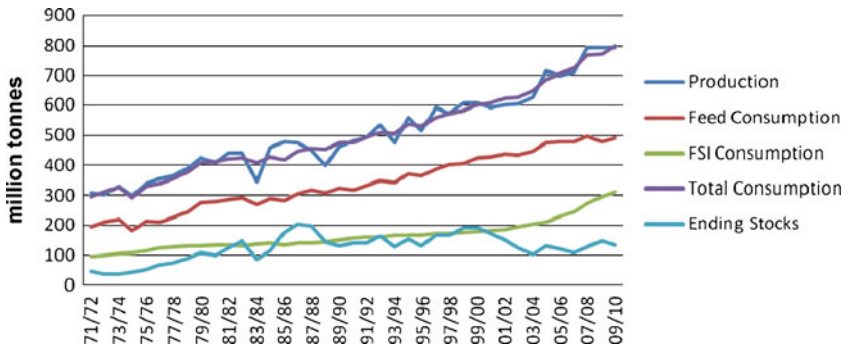

Fig. 3 Global statistics for maize, 1971–2010 (data from USDA Production, Supply and Distribution Online website http://www.fas.usda.gov/psdonline)

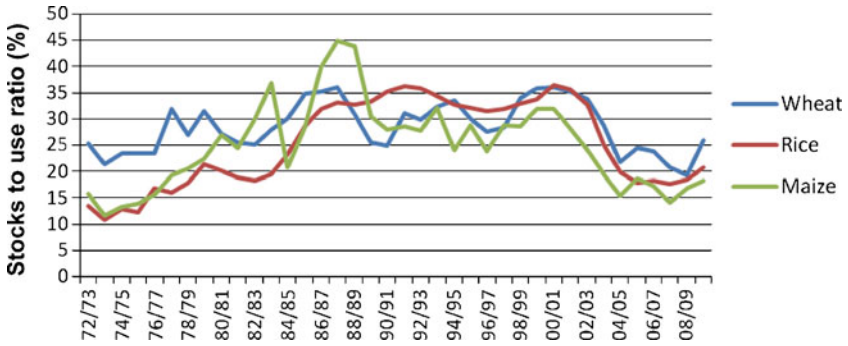

Fig. 4 Stocks to use ratios for major grains, 1972–2009 (data from USDA Production, Supply and Distribution Online website http://www.fas.usda.gov/psdonline)

of the mitigation, which may well render it unsustainable in the long term.

Second, public stocks can crowd out the private grain trade sector. Notably, in almost every situation (except where government is the sole importer of grains), public stockpiles exist in parallel with the normal flow of private sector grains. Given the need to rotate government stockpiles (to minimize storage losses), there will be a need to release stocks from the reserve and to replenish them. These releases of government stocks decrease domestic prices, which poses a risk to private storers and traders. The distribution of grains by the government at prices below those of imported private grains could cause the private sector financial losses in the immediate term.

Slightly more concerning and potentially more damaging, is that the private sector will be disincentivized to continue to import due to the risk of future financial losses induced by government market intervention. This burden on the private sector is a hidden cost of government storage that must be considered (Dorosh 2009). This added cost to private storers may lead to a reduction in private sector stock holding and therefore necessitate the government to take a more active role in the import of grains—not only to cover emergency situations (Wright 2009). To mitigate this risk, the government should either ensure that the release prices for the grain are at prevailing import parity or that they sell the grain for export from the country to avoid negatively impacting the domestic market.

Third, stockpiling can place a large fiscal strain on governments. The financial resources required to purchase and maintain an expanded stock of grains can be prohibitive. For example, an imported stock of 100,000 t at an indicative price or US$250/t delivered silo will require a minimum of US$25 million in hard currency. One risk that can flow from this commitment of resources is that the government does not then have resources available to either address other domestic requirements or to react to other unforeseen situations. The implications of this financial burden on MENA countries are wide ranging. For countries that do not benefit from major hard currency denominated exports, mainly petroleum, the foreign reserve pressures that can ensue from having to commit such large amounts of hard currency can place the budget and domestic currency exchange rates under stress. Even for oil-rich countries in MENA, drops in oil prices or major changes in the international foreign currency markets can be problematic, particularly when the price of cereals does not move in lockstep with oil prices.

Further considerations of physical stocks

Stock management, inventory and position management systems The management of physical grain stocks is a regular activity in the major production markets. There have been major advances in technology for monitoring grain quality and ensuring stock turnover to minimize losses. This technology and know how are commercially available and any government implementing a strategy that involves stockpiling should avail themselves of them. In addition, for those commercial operators who are involved with the sale and position management (i.e. monitoring price implications for stock positions) of grains, their stock

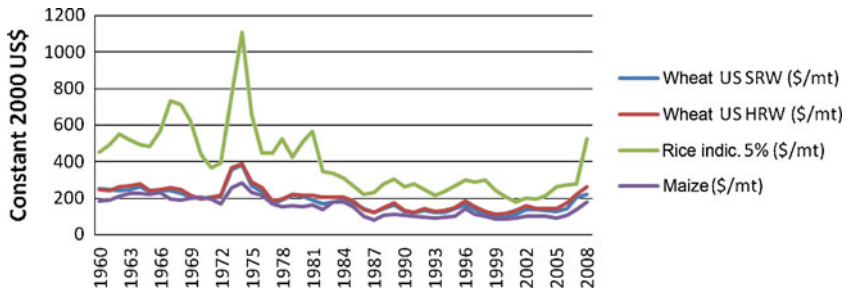

Fig. 5 Constant 2000 annual average prices for major grains, 1960–2008 (data from World Bank Commodity Price Data website http://www.worldbank.org)

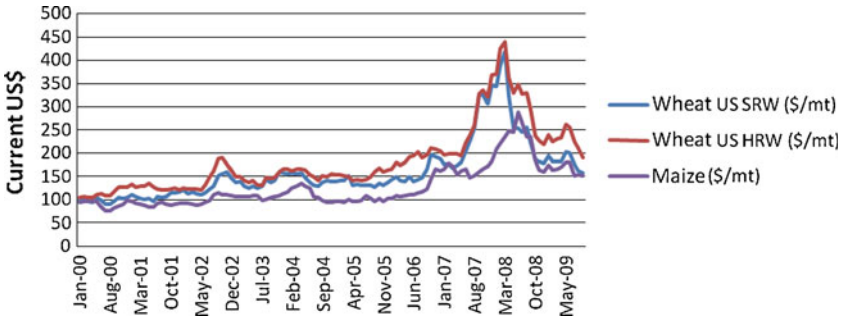

Fig. 6 Price levels for wheat and maize, 2000–2009 (Data from World Bank Commodity Price Data website http://www.worldbank.org)

management system is intrinsically linked to their sales operations. Use of such systems is critical for financial management of stockpiles and, by implication, the sustainability of a stockpiling strategy. Governments should retain the services of professionals active in this field.

Overseas stocks A mitigation strategy that should be considered in conjunction with other approaches is the use of overseas stocks. One risk inherent with domestic stockpiling is that, should there be a need to release stocks to the market (either for rotation or position management reasons), the additional freight costs of 're-exporting' the grain may be prohibitive and/or incur severe financial losses. The use of temporary 'hub' storage in facilities that are still located on major grain transit routes is an effective method to mitigate this risk. The government will still have the stocks at its disposal should they be required, but can release them to the international market with no additional freight/handling losses should that not be the case. For MENA countries, these overseas stocks could be held near the point of production, or for greater security over physical availability, stocks could be held at a shipping hub within the region. This strategy would allow for more flexibility in distribution throughout the region than a collection of domestically held stocks scattered throughout the region.

Private sector stocks A strategy that mitigates the need for government funding and management of stocks is one that would involve the private sector in maintaining stocks in domestic storage facilities. In this scenario, the government would have first call (perhaps at a pre-determined price) or option on these private sector held (and financed) stocks. For this, the private sector would require a premium (payment) for this service. However, this would only represent a small percentage of the total value of the goods. Should government decide that they do not need the stocks, then they would not exercise their option to buy and the private sector would be free to sell them on the world market. If government were to decide that they did need the stocks, then they would purchase the grains at the agreed price. The advantage of this strategy is that it reduces the initial financial burden on the government. It also enables government to transfer the price risk to the private sector, while reducing counterparty risk (the stocks being held domestically). For the private sector, the existence of the price agreement enables them to manage their price risk in the financial markets and working within the government strategy gives them increased predictability in terms of government actions. Private firms are also able to transfer the risk of adverse government actions (e.g. sequestration of stocks or export bans despite non-exercise of the option) to the international market through the purchase of political risk insurance.

Commodity finance If a strategy of active involvement of the private sector is not attractive, or is only to be used for a portion of a stockholding strategy, the issue of the financial demands on the budget created by purchasing and holding large stocks (and the inherent additional macroeconomic stresses) still remain. The use of trade commodity finance tools can reduce this burden. The stockpile presents a government with the opportunity to use stocks as collateral to enable them to structure a financial solution. By pledging the stocks to a commercial bank, the government will be

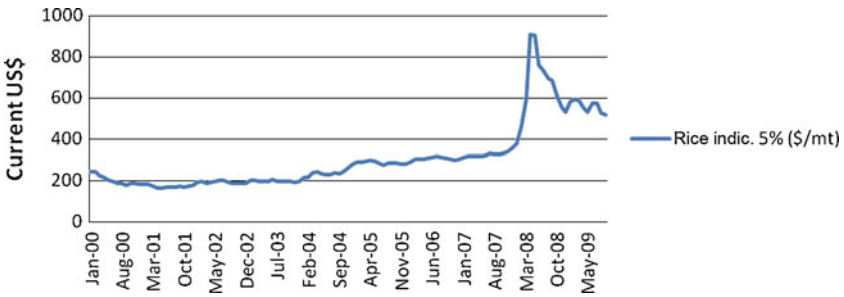

Fig. 7 Price levels for rice, 2000–2009 (Data from World Bank Commodity Price Data website http://www.worldbank.org)

able to release cash from the original transaction. This obviously comes at a cost and it should be noted that it will not be possible to raise 100% of the cost of the original purchase, as a bank will discount the value of the stock in relation to the underlying price volatility in the grains market. While this is normal practice in commodity trading, it is appreciated that in the MENA region it would need to be adapted to Islamic financing models. We have provided a short overview of the availability of this sort of financial solution in the Sharia context in a separate section later in the paper.

Early warning systems and market information

To help identify and mitigate both physical availability risk and price risk, the League of Arab States has proposed a regional food security monitoring system to help determine the location and magnitude of assistance that would be needed in the event of a global food shortage. Such a strategy can be combined with monitoring of seasonal production in the main grain exporting markets (whether or not they actually import from these countries) and the annual global stocks carry over ratios. Such an activity requires little investment, but does require the creation of a small, dedicated unit whose sole responsibility is to provide the risk management decision makers with clear market and production information. Much of this information is available for free and even online.[2] Factors such as weather and planting indications should be closely monitored. In the case of MENA countries that produce a substantial amount of their own grains, such as Syria and Morocco, monitoring would need to be done domestically as well as in exporting countries (World Bank 2009).

It would also be advisable to retain the services of a qualified commodity broker specialized in grains who could provide clear production information on a regular basis. Clearly, maintaining a large stock of grain when there is ample global production and large stocks available is not a cost effective mitigation strategy (especially in the face of inevitably falling international prices). Equally, early warning of crop failures in major producing countries or indications of potentially non-favorable weather patterns (e.g. El Niño) would enable the government to start taking measures to ensure that their stockpiles are of sufficient volume should there be a problem with availability of supply. This forewarning would also enable the government to 'mask its trade', which effectively means that they would be able to go into the market on a staged basis seeking to minimize the price pull effect that they would cause if they were to suddenly request very large volumes for delivery.

[2] Examples include United States Department of Agriculture Foreign Agriculture Service, United Nations Food and Agriculture Organization, Chicago Mercantile Exchange, InterContinental Exchange, and Euronext Liffe.

Bilateral and multilateral agreements to limit export restrictions

It is held that export bans and other restrictions were one of the main drivers that pushed grain prices higher in 2008 (Mitchell 2008; Dorosh 2009; Wright 2009). Restrictions occurred in Argentina, India, Kazakhstan, Pakistan, Ukraine, Russia, and Vietnam. These restrictions were placed by the governments of the exporting countries, not by their private sectors, which would have benefited by selling at high prices on world markets. Such restrictions result in counterparty risk (risk that a shipment will not be made, or be made at a higher price, because of government imposed restrictions), quantity risk (there is less grain on world markets), and price risk (world price increases are exacerbated by exporting countries restrictive policies to keep domestic prices low). It is clearly an option for the governments of importing countries to attempt to reach agreements with the governments of the major exporting countries to ensure that they would receive preferential terms of trade should such an event occur in the future. Taking this strategy a step further, countries or groups of countries could apply political pressure to outright forbid these policies in times of global food shortages (Wright 2009). Obviously, the potential for defaults on these agreements would still exist and there remains the issue of the private exporters in the countries still performing. This is obviously not a stand-alone mitigation measure, but may be of value in conjunction with other approaches.

Overseas production arrangements

The potential for direct investment in grain producing countries as a means to secure supply has attracted a large amount of interest, especially in the past 2 years. There has been and continues to be international debate about the potential beneficial and negative impacts of such a strategy, consideration of which are not within the ambit of this paper but dealt with extensively in other papers in the current special issue of this journal.

From a risk management perspective, this mitigation tool may potentially reduce the likelihood of export bans, remove counterparty performance risk, and potentially increase production and thereby reduce the physical availability risk. However, it does not address underlying production risk itself. A drought (the sort of event that could lead to an export ban) will still have a major negative

impact on the yield of crops covered by the arrangement. Such a drought may also cause domestic food insecurity in the production country and potentially complicate grain exports, even to the investing country. The large amounts of capital required for these types of investment will be subject to both political and project risk. The price and availability risk in relation to freight (both internal and sea freight) will both remain, unless addressed by major investments in transport assets. Therefore, from a cost-benefit perspective, such a strategy would require careful examination and comparison with other alternatives, especially when one considers the risks that are either unaddressed or created by such a strategy.

Performance risk

Spot purchasing: advantages and risks

In the majority of cases, government grain procurement throughout the MENA region is executed through the use of international spot tenders. After a declaration of intent to tender, bidders are invited to submit their price quotes against a standard set of procurement parameters (volume, quality, acceptable origins, and delivery date). Declaration periods differ, but generally tenders are announced from between 1 to 2 weeks before closing date, with no pre-tender announcement having been made.

Although there are clear transparency advantages to this form of public procurement, from a risk management perspective, it does leave a number of inherent risks. First among these is the fact that the tendering government is left vulnerable to the market, having to take the market price on the day of the tender, but we shall discuss this in more detail in the section on price risk below.

Traditionally it has been perceived that the shorter the period between contract conclusion (and price fixation) and the time of delivery, the lower the performance risk related to the transaction because of the heightened certainty for the supplier and reduced price exposure on a time basis. However, in volatile price markets and with increasing production uncertainty (or reduced stocks availability), the exact opposite may now be true. When there are ample global stocks, suppliers' access to grains to supply under this type of tender is high. When there are low stocks, the ability of suppliers to source grains at short notice is vastly reduced and their own counterparty supply risk is higher. When a supplier has short lead times to procure and position stocks for supply to buyers, they do not have time to lock in a number of different supply options and therefore their ability to perform in accordance with the contract is reduced (and therefore the government's counterparty performance risk increases).

In addition to the above, although not a 'technical' issue, the tender system specifically runs counter to the development of supplier loyalty. For a supplier, the inherent value of any one tender is the profit margin that they may make on that trade. They do not take a long-term view, as they may well not succeed at the next tender and their positive performance under this one will largely not affect the outcome of the next. Because of the nature of the transaction under a tender system, suppliers and buyers have little incentive to establish trust, and therefore the probability of default is higher.

An associated risk is the availability and pricing of reliable freight. Depending on the terms of the supply contract, this may be faced by either the supplier or the importing government (depending on whether the grains are to be supplied on a delivered to the buyer basis), but ultimately will be suffered by the government—the negative effect of the risk being non-delivery of the grain.

Alternatives/complementary strategies and management tools to spot tenders

If spot tenders remain as the preferred procurement method, then there are a number of mitigation tools that can be used to manage some counterparty performance risks. The requirement for posting performance bonds prior to tender is an effective means to ensure that only serious parties actually tender. Of course, the value of the bond needs to be of sufficient quantum to ensure that the loss of the bond deters suppliers from defaulting on contract conclusion after the tender. However, in order that this requirement does not constitute a major impediment to many suppliers, the bond should be in the form of a guarantee issued by the supplier's bank (which would need to be rated first class), releasable or claimable on very clear terms (i.e. not in the form of cash deposit bonds). In the actual supply contract, there should be a requirement for the provision of a performance guarantee issued by the seller's bank or structured escrow account. The amount of the performance guarantee or bond needs to be carefully considered in light of prevailing market conditions. For example, in times of high price volatility, the amount of the guarantee should be sufficient to cover potential adverse price moves (normally the main reason for supplier default). However it should be noted that (if it is not already normal practice) the buyer, in return for this protection, may need to provide collateral in the form of an intermediated payment vehicle (for example an irrevocable letter of credit).

Another possibility is to use structured forward contracts, which are still tendered. In order to increase the ability of suppliers to meet the terms of delivery (especially quality) and thereby mitigate the risk of default, the use of tenders with longer delivery terms would be advantageous.

As opposed to issuing spot tenders with nearby delivery terms (e.g. 6 weeks), placing tenders with longer delivery terms would enable suppliers not only to identify more supply options, but also enable them to better manage the performance risk that they face on the supply side (they could use alternate sources of supply if they faced defaults themselves and/or place physical call options with other suppliers to manage the risk of default of their principal supplier). Obviously, the use of such tenders will necessitate governments using improved stock pipeline systems and longer-term stock requirement forecasting.

An alternative to using spot tenders is a long-term supply contract. If a government is able to identify and forecast a core stock requirement for an extended period (e.g. for deliveries over a 6 to 12 month period), then there would be value in the conclusion of long-term supply contracts with major trading houses. These contracts should still be awarded on a competitive basis and would have the advantage that the government can introduce a number of performance and pre-qualification criteria that would enable a government to choose its partners on more than simply price indicators. Such contracts can include performance based indicators that would dictate continuation of and/or re-awarding of the supply contract. Standard indicators are price performance against an agreed price reference point, timeliness and quality of deliveries, etc. Another advantage of such contracts is that the government can require that some of the major terms are variable or fixed (for example price, quantities, origins, qualities) and choose the dates for execution of the options. This type of contract would enable governments to gain a number of contract certainties, while building in flexibility to enable them to adjust the supply contract to take into account market realities. If these types of contracts are of sufficient volume and offer some form of intermediated payment vehicle, then the supplier has a major vested interest in ensuring their performance. From a business point of view, there is a big difference between defaulting on a 30,000 t supply contract and losing a 500,000 t long-term supply contract. For the supplier, the existence of the contract and a payment vehicle enables them to take suitable physical positions, manage price risks, make long-term freight agreements at preferential rates and ensure quality requirements, thereby reducing their own performance risks (to the benefit of the buyer).

As we will see in the following section, performance risk can be reduced through the use of commodity exchanges, which manage this risk through margin requirements on buyers and sellers of futures through the exchange. However, this only applies to financial, not physical products. There is, however, a means of seeking to achieve the same coverage in the physicals market—the use of an intermediated contract. There are many different definitions and types, but the best known is a physical OTC, or Over-the-Counter transaction. OTCs are normally used for trading of financial products between banks and their clients, although they are also used in physical trading. For a physical OTC, a bank will contract to deliver the physical commodity to the buyer, effectively taking the counterparty risk of the original seller. From the buyer's point of view, they may find that taking the bank's risk is more attractive than the seller's (the bank being financially stronger and having larger reputational drivers to ensure performance). For the bank, they will charge a fee for this service and feel that they are either able to ensure the seller's performance (because they have a long standing financial relationship) or would be able to contract another seller to perform on the terms of the contract, while pursuing the original seller legally. This type of transaction is often used by buyers when there is a degree of concern about the counterparty risk that is potentially posed by a seller.

There are a number of mostly unforeseeable risks that may either directly or indirectly impact on the ability of the supplier to perform the contract, collectively called *force majeure*. These include such issues as natural disasters or civil conflicts. These would normally be covered in the *force majeure* clause in a supply contract. While a contract may be frustrated by *force majeure* clauses, the buyer can seek to insure certain types of specific *force majeure* events. Obviously, the quantification of foreseen losses will be required and the higher the quantum, the more expensive it will be to insure. Equally, while there will be financial compensation in the case of a *force majeure* driven default, the grains will still not have been delivered. However, the value of the payment can be used to discount the cost of concluding prompt grain deliveries (which are often more expensive than the original transaction).

Price risk

Price risk with spot purchasing

A risk inherent with spot purchasing is that governments are not able to manage the price that they will pay on an *ex-ante* basis. They are at the mercy of the market whenever they need to make a purchase. This applies not only to the price of the grains, but also to the freight rates (which can be heavily driven by demand for freight and the price of fuel). For oil-rich countries, high fuel prices can act to partially counteract high food prices (when there is correlation in terms of pricing and timing), but for MENA countries that do not produce petroleum, concurrently high grain prices and oil prices pile on each other.

One impact of this price uncertainty and inability to manage price risk is that budgetary planning for grain

imports is difficult and often incorrect. When price volatility is low, this risk is not of major concern. However, when price volatility increases, the impact of this risk can be dramatic and potentially disastrous. In a constrained budgetary environment, this may result in the purchase of lower levels of grain than required, with an impact on either rations or levels of market support.

Alternatives/complementary strategies and management tools

It is possible to transfer price risk to the international markets through the use of futures and options. Effectively, this is the purchase of price insurance and the use of such a strategy may offer a government price protection against increases in the price of grains. The contracts on the futures exchanges are financial products or assets and only a very small percentage are actually settled by the delivery of physical stocks against the futures contracts (e.g. *circa* 0.5% of wheat contracts on CBOT, the Chicago Board of Trade).

Countries large and small, rich and poor, exporters and importers, can potentially use these instruments to stabilize grain prices by using global exchanges, establishing local exchanges, or a combination of both (Dana et al. 2006; Larson 1993; Sheales and Tomek 1987). In a region as diverse as MENA, financial instruments are risk management tools that have the potential to be employed by all countries in the region as part of a broader risk-management strategy (World Bank 2009). Estimates produced by the World Bank (2009) indicate that Egypt, a major wheat importer in the region, could have saved between 5 and 24% of the approximately $2.7 billion spent on wheat imports from November 2007 to October 2008 through the use of financial hedging products.

There are, however, limitations to this strategy. *Prima facie*, purchasing futures and options will not address the availability or physical delivery issue, only financial compensation and therefore it should only be considered as potentially part of an overall strategy which also has a physical delivery component. In other words, this strategy potentially protects an importer from price risk, but not from physical availability risk unless special considerations are also made concerning physical delivery.

The financial strategy may not completely cover the government from all adverse price moves. This is known as basis risk. This is a simple concept, but a complicated subject. Firstly, price moves on the futures exchange may not mirror the price moves in the physical market from which the government is actually buying. Secondly, it is possible that the price moves in the futures market do not even match the changes in the physical price in the delivery markets in which the futures are traded. This phenomenon is known as divergence and is normally a temporary situation, although the CBOT wheat contract (Hard Red Wheat—HRW) has been suffering from varying degrees of divergence for over a year. Thirdly, the cost of freight from different origins may move dramatically, which the strategy does not cover. Given that the cost of freight is a relatively high proportion of the value of delivered grains, this can lead to large losses.

The costs of maintaining a futures position can be much more expensive than originally perceived. A buyer of futures is required to post an initial margin and also a maintenance margin. The value of these margins depends on the commodity, on the exchange and on the price volatility of the commodity. Presently, total margins are *circa* 10% for most commodities. Holders of futures positions are then expected to replenish the maintenance margin in accordance with the movements in the futures price. In highly volatile markets where there are large price swings, this can require a large amount of cash to be deposited with the exchange at very short notice. As an example, in the cotton futures price crash of March 2008, one trading house was required to post a US$1 billion margin call within 4 h. In the grain markets, this sort of magnitude should not occur, as the pricing of the margins is different. However, in simple terms, if the futures markets for wheat drop by US$10/t and the government has a two million tonnes futures position, there will be a requirement for a margin call of US$20 million.

Given the potential cash requirements for margin calls on futures, it might be more attractive to purchase call options. These are simply the opportunity (option) to buy a futures contract at a predetermined (fixed) price at a given time in the future. The seller of the option will charge the buyer a fee called a premium. The value of the premium is largely determined by the price volatility in the market, the length of time in the future that the option is available for and prevailing market view of the likely value of the future at that future time. The premium has to be paid in full at the time of the purchase of the option. This is likely to be more expensive than the margin calls that are required for futures and it is also non-refundable. If the market price in the future is higher than the price at which the option is bought, then the buyer exercises the call, receives the future, sells the future at the new higher price and the market difference is their financial margin (minus the original cost of the option).

However, as with futures, options have limitations. First, the option, if exercised, provides a buyer with a futures contract, which still has the same problems in terms of lack of physical delivery and basis risks. Second, if the actual futures price is lower than the option at the time of expiry, then the buyer will not exercise the call and it will expire. The buyer thus loses the original cost of the option, but theoretically now buys the physical commodity at the lower

market price, thereby making a saving, but this can be eroded by the basis risk. In highly volatile markets options premiums can be a substantial percentage of the value of the future and therefore the 'lost' premium can be high.

Forward contracts, discussed earlier in the section on alternatives to spot tenders, can also be used to mitigate price risk. A traditional strategy for a buyer to mitigate future price risk is to conclude forward delivery contracts at a fixed price (commonly referred to as physical price risk management). This effectively now passes or transfers the underlying price risk to the seller, who now has the price risk exposure. One problem with this strategy is that transferring this risk may result in a heightened counterparty performance risk. If the seller fails to manage the price risk and the market moves against them in the intervening period, they will be faced with a choice of making a financial loss on the delivery, or defaulting on the contract. The larger the financial loss, the higher the likelihood of default. This is the advantage of a financial strategy—the exchange is the counterparty, but they cover their exposure through requiring margin calls and therefore mitigate the financial performance risk for the buyer. We have referred to the use of guarantees, OTCs and engendering supplier loyalty, but another means to reduce counterparty risk, while achieving a degree of price risk cover, is to 'share' the price risk with the supplier. Contracts can be structured on a number of different price terms, e.g. buyer's declared option, determined share between buyer and seller of price moves outside of certain price bands, use of initial price point with agreed buyer and seller share of price movements, percent of contract volume with fixed price and percent unfixed, etc. A critical decision for a government entering into such types of price clauses revolves around the price that they are willing to pay and to what extent they are prepared to retain some of the price risk themselves. In so doing, they do not put all of the pressure on the seller and thereby reduce the counterparty performance risk.

As a final note on price risk, it should be mentioned that price volatility offers governments not only negative price exposure, but also positive. There will be periods when stocks (purchased when prices were below current market prices) will be of relatively high value. At these times, governments can sell stock that is in excess of strategic requirements, bringing a financial windfall. The depositing of these funds into a price stabilization account would enable government to have funds at its disposal when faced with an increase in purchase prices or having to subsidize the release of grains into the domestic market at prices below their replacement cost. Obviously, this strategy neither seeks to mitigate nor transfer the price risk, but does seek to enable the government to be able to cope with the financial impact of unmanaged price risk. This would be the least attractive strategy, as it does not really address the risk. It also requires government to have a very accurate understanding of its stock position (both physically and financially) and for it to clearly set a price point at which it will seek to intervene with subsidized releases, etc.

The Sharia context

This paper has been based on risk management strategies and tools that may not be, *prima facie*, Sharia compliant. For example, there are potential issues in relation to *bayu al-gharar* (loosely translated as trading in risk) and the use of financial price risk management tools such as futures and options. The use of traditional types of collateralized finance products would equally raise issues in relation to the charging of interest (*riba*) on such facilities. A comprehensive discussion of Sharia compliant tools that may be available would constitute a paper of its own. However, it should be noted that there are such products and practical examples of their use available. For example, the Global Multi Commodities Receipt (GMCR) and International Commodity Receipt (ICR) products offered by the Dubai Multi Commodities Centre (DMCC) provide a clear example of the potential to use collateralized finance. The developments on the same trading platform and others in the region that will now link with other commodity exchanges have opened opportunities in financial risk management. In addition, Maybank Islamic Berhad (MIB) has recently (August, 2009) launched a special Sharia compliant trade finance solution called the Collateral Management Arrangement-i (CMA-i) which involves a tripartite contract between the bank, the customer and a collateral manager. It would therefore appear that the tools and strategies that have been outlined in this paper are relevant for governments who operate in a Sharia context, but that their specific format should be identified within the Islamic banking community.

Managing the risk management

As mentioned in various parts of the paper, risk management strategies need to be managed themselves. They need to correlate with market and production realities at the time of development. They need (in order to be sustainable) to be sufficiently financed and monitored. They also need to be reviewed during implementation to take into account any relevant developments since they were initiated (political, production-related, financial constraints, price, etc.). Moreover, any successful strategy will take into account and consist of a number of tools. It is rare that any one tool can address all risks and invariably (as we have seen), they often result in other risks becoming prevalent and requiring supporting tools to manage them.

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