

A close-up photograph of a hand holding a stalk of grain, possibly wheat or barley, against a bright, golden sunset background. The hand is positioned on the right side of the frame, and the grain stalk is held between the fingers. The background is a soft, out-of-focus field of similar grain stalks, creating a warm, golden glow.

# Guide to managing commodity risk

October 2012

ISBN: 978-1-921742-33-0

CPA Australia Ltd ('CPA Australia') is one of the world's largest accounting bodies representing more than 139,000 members of the financial, accounting and business profession in 114 countries.

For information about CPA Australia, visit our website [cpaaustralia.com.au](http://cpaaustralia.com.au)

First published 2012

CPA Australia Ltd

ACN 008 392 452

Level 20, 28 Freshwater Place

Southbank Vic 3006

Australia

**Legal notice**

Copyright CPA Australia Ltd (ABN 64 008 392 452) ("CPA Australia"), 2012. All rights reserved.

Save and except for third party content, all content in these materials is owned by or licensed to CPA Australia. All trade marks, service marks and trade names are proprietary to CPA Australia. For permission to reproduce any material, a request in writing is to be made to the Legal Business Unit, CPA Australia Ltd, Level 20, 28 Freshwater Place, Southbank, Victoria 3000.

CPA Australia has used reasonable care and skill in compiling the content of this material. However, CPA Australia and the editors make no warranty as to the accuracy or completeness of any information in these materials. No part of these materials are intended to be advice, whether legal or professional. Further, as laws change frequently, you are advised to undertake your own research or to seek professional advice to keep abreast of any reforms and developments in the law.

To the extent permitted by applicable law, CPA Australia, its employees, agents and consultants exclude all liability for any loss or damage claims and expenses including but not limited to legal costs, indirect special or consequential loss or damage (including but not limited to, negligence) arising out of the information in the materials. Where any law prohibits the exclusion of such liability, CPA Australia limits its liability to the re-supply of the information.

# Contents

<b>About the author</b>	<b>2</b>
<b>Introduction</b>	<b>3</b>
What is commodity risk?	3
Types of commodity risk	3
Effects of commodity price fluctuations	4
Sensitivity analysis	4
<b>Methods to measure commodity risk</b>	<b>5</b>
Portfolio approach	5
Value at Risk ('VaR')	5
Value at Risk ('VaR')	5
<b>Alternatives to financial market instruments</b>	<b>6</b>
<b>Producers of commodities</b>	<b>7</b>
Strategic risk management	7
Diversification	7
Flexibility	7
Price risk management	7
Flexibility	7
Pooling	8
Storing	8
<b>Buyers of commodities</b>	<b>9</b>
Supplier negotiation	9
Alternative product sourcing	9
Production process review	9
Changing product offer	9
<b>Appendix 1</b>	<b>10</b>
<b>Appendix 2</b>	<b>12</b>

# About the author

This guide has been prepared by Jan Barned, CPA, who has worked in financial markets for more than twenty years. Her experience includes working for a number of commodity-based businesses including primary producers, manufacturers and mining companies. She now runs a successful consulting business — Financial Management Trainer ([www.fmtrainer.com.au](http://www.fmtrainer.com.au)), which assists not-for-profit organisations and small and medium-sized businesses in all aspects of business planning, including improving business performance and specialising in training business owners and managers in good practice financial management.

Jan is an experienced trainer and facilitator and has authored numerous publications for CPA Australia.

# Introduction

This guide provides an overview of the issues associated with understanding and managing commodity risk. Readers may need to make further enquiries to understand more fully the issues associated with commodity risk management as they relate to their business and the most appropriate methods to reduce such risks.

## What is commodity risk?

Commodity risk is the risk that a business's financial performance or position will be adversely affected by fluctuations in the prices of commodities. Producers of commodities, for example in the minerals (gold, coal etc.), agricultural (wheat, cotton, sugar etc.) and energy sectors (oil, gas and electricity), are primarily exposed to price falls, which mean they will receive less revenue for the commodities they produce. Consumers of commodities, such as airlines, transport companies, clothing manufacturers and food manufacturers, are primarily exposed to rising prices, which will increase the cost of the commodities they purchase.

Commodities generally fall into three categories:

- **Soft commodities** include agriculture products such as wheat, coffee, sugar and fruit.
- **Metals** include gold, silver, copper and aluminium.
- **Energy commodities** include gas, oil and coal.

A business should consider managing commodity risks where fluctuations in commodity pricing and/or supply may impact on the business's profitability. In an organisation in which the core operations are anything other than financial services, such risk should be appropriately managed so that the focus of the organisation is on providing the core goods or services without exposing the business to unnecessary risks.

## Types of commodity risk

There are four types of commodity risk to which an organisation may be exposed:

- **Price risk:** arises from an adverse movement in the price of a commodity as determined by forces outside the control of the organisation
- **Quantity risk:** arises from changes in the availability of commodities
- **Cost (input) risk:** arises when adverse movements in the price of commodities impact business costs
- **Political risk:** arises from compliance or regulation impacts on price or supply of commodities.

Generally, there are three groups that will be exposed to commodity risk:

- **Producers:** can include farmers, other agricultural producers and miners. They can be exposed to all of the types of risks noted above.
- **Buyers:** can include cooperatives, commercial traders and manufacturers who consume commodities in their production processes. Such organisations can be exposed to commodity risk through the time lag between order and receipt of goods.
- **Exporters:** face risk from the time lag between order and receipt from sales, as well as political risk where compliance, regulation or availability can adversely impact sales price.

## Commodity and foreign exchange risk

Generally speaking, most commodities are priced and traded in US dollars (USD), and organisations that are exposed to commodity risk may also carry foreign exchange rate risk. Managing commodity risk in isolation of any exchange rate risk will leave the organisation exposed to adverse movements in the currency in which the commodity is priced and/or traded. This may materially influence the organisation's profitability. Therefore, when undertaking any strategy to manage commodity risk, due consideration should also be given to managing foreign exchange rate risk. For more information on managing foreign exchange rate risk, see CPA Australia's Guide to managing foreign exchange risk at [cpaaustralia.com.au/cps/rde/xchg/cpa-site/hs.xsl/knowledge-management-toolkit-foreign-exchange-risk.html](https://cpaaustralia.com.au/cps/rde/xchg/cpa-site/hs.xsl/knowledge-management-toolkit-foreign-exchange-risk.html).

## Effects of commodity price fluctuations

Falling commodity prices can:

- decrease sales revenue for producers, potentially decreasing the value of the organisation, and/or lead to change in business strategy
- reduce or eliminate the viability of production — mining and primary producers may alter production levels in response to lower prices
- decrease input costs for businesses consuming such commodities, thus potentially increasing profitability, which in turn can lead to an increase in value of the business.

Rising commodity prices can:

- increase sales revenue for producers if demand is not impacted by the price increase. This in turn can lead to an increase in the value of the business.
- increase competition as producers increase supply to benefit from price increases and/or new entrants seek to take advantage of higher prices
- reduce profitability for businesses consuming such commodities (if the business is unable to pass on the cost increases in full), potentially reducing the value of the organisation.

# Methods to measure commodity risk

The very nature of commodity risk for an organisation means that measurement of this risk requires a structured approach across all operational business units. Given the types of commodity risk, many organisations will not only be exposed to a core commodity, but may possibly have additional exposures within the business. For example, a commodity producer such as a gold mining company is obviously exposed to movements in the gold price; however, its likely high consumption of fuel can also impact on profitability and cashflow.

When measuring commodity risk, it is important to identify all the key risks to the organisation. If this procedure is not undertaken accurately, the management of the commodity risk can in fact create additional risk. This is particularly relevant where the commodity price is managed in isolation of foreign exchange rate risk.

Measuring commodity risk requires analysis of the potential exposure and an understanding of how changes in commodity prices affect both financial and operational drivers of the organisation. This guide provides some examples of measuring commodity risk.

## Sensitivity analysis

One of the simplest measures is to undertake sensitivity analysis to measure the potential impact on the organisation of an adverse movement in commodity prices. This may be done by choosing arbitrary movements in commodity prices or by basing commodity price movements on past history. For example, the organisation may wish to know how much it will gain or lose in the event of a given change in commodity prices.

Where commodities are priced in foreign currency, organisations sometimes develop a matrix showing the combined result of currency and commodity price movements. For example, wheat prices are based on USD. When measuring the exposure to movements in wheat prices, an Australian wheat farmer will need to look at both the USD price for wheat and also the AUD/USD exchange rate variations to measure the different scenarios in both exchange rate and wheat price.

## Portfolio approach

The portfolio approach encompasses the sources of commodity risk to the organisation and allows for a more detailed analysis of the potential impact on financial and operational activities. For example, organisations that are exposed to fuel pricing may do scenario testing on the adverse movement in fuel price, but they will also include in the measurement of risk the potential impact of limited fuel availability, changes in political policies (for example, where the government takes control of the supply and/or price of fuel), and/or the impact on operational activities by any one or combination of these variables.

Just as an organisation assesses the effectiveness of advertising on sales, analysis of commodity price movements can be modelled across various operational activities within the organisation, such as sales, margins and costs. The portfolio approach should be undertaken, utilising stress testing for each variable and combination of variables.

## Value at Risk ('VaR')

Some organisations, particularly financial institutions, use a probability approach when undertaking sensitivity analysis known as 'Value at Risk'. While it is useful to know the potential impact of a given change in commodity price, the question will arise: what is the probability of this event occurring? Accordingly, sensitivity analysis can be conducted using past price history and applying it to current exposure. The organisation can then say that, given its current exposure and based on commodity prices observed over the past two years, and given a quantified movement in commodity prices, it can be 99 per cent confident that it will not experience a loss of more than a particular amount. In effect, the organisation has used actual price history to model the potential impact of commodity price movements on its exposures.

# Alternatives to financial market instruments

The most appropriate methods for managing commodity risk will vary between organisations. The risk profile of the organisation, together with other variables such as production processes, marketing strategies, timing of sales and purchases, basis risk of hedging products (how close the hedge product matches the commodity) and availability of hedging products, should be analysed as part of the overall method to managing commodity risk. As these will vary from organisation to organisation, it is recommended that expert advice be sought when considering implementation of commodity risk management within the organisation.

Larger organisations that carry greater commodity risk will often enlist financial institutions to assist them in managing this risk through the use of financial market instruments.

However, small and medium-sized businesses may not be able to access this market as the overall size of their commodity risk may not be large enough to use the financial markets effectively. In this section, alternatives to the use of financial market instruments will be discussed. An overview of ways to manage commodity risk on the financial markets is provided in appendix 1.

For those organisations that are impacted by fluctuating commodity prices, proactive risk management can assist in minimising potential financial consequences from commodity risk. For both producers and buyers of commodities, one of the simplest ways to manage commodity risk is to review current procedures and operational activities.



# Producers of commodities

For those who produce or mine commodities, such as farmers, market gardeners and miners, commodity risk lies in the price received for production. The pricing of these commodities is determined by a number of factors that can include supply, demand and cost of production. Additionally, for commodities that are traded on international exchanges, activities of traders and political risk can also affect price.

## Strategic risk management

Managing commodity risk through strategic business planning can provide an effective, proactive risk management alternative. Common strategic initiatives to manage commodity risk include diversification and flexibility.

### Diversification

Diversification is one of the more common methods used to reduce risk and uncertainty. For example, many primary producers will rotate crops and/or livestock to manage the price and cost risk associated with production. This can be a very effective way to manage commodity risk; however, the primary producer will need to take a number of elements into account. By having more than one product in the farm business, the risk of a large loss from price volatility can be reduced. However, for diversification to be most effective, producers need to ensure that alternative production is not subject to the same or similar price risk.

Of course, producers must also be aware that diversification may incur significant costs in the form of reduced efficiencies and lost economies of scale when resources are diverted from a core business or a specialised operation to a new or different business venture. For example, a grain grower may also run livestock on part of the property as a risk diversification strategy. However, the cost of production of livestock can be exposed to volatility in grain prices when grain is used in feed for the livestock. Some producers may choose to provide goods to niche markets for a higher price but, given the specialty of the market, may also sell into more stable markets to cover any potential reduction of demand in the niche market.

### Flexibility

Flexibility in some instances can be considered a subset of diversification, although an organisation that seeks diversification without flexibility will often create additional risk. A flexible business is one that has the ability to change in line with changing market conditions or other events that potentially may have an adverse effect on the profitability of the organisation.

Flexible producers have the ability to change production processes in line with pricing movements. For example, a market gardener may grow some produce in hot houses in the 'off season', when supply is short and higher prices can be obtained, or farmers may have highly weighted inputs costs, so that when prices are low, variable costs are reduced. Where producers are contract growers, they may have alternatives in place to cover the risk of termination of a contract.

## Price risk management

Primary producers often undertake specific price risk management activities to manage commodity risk. Some of the more common methods are production contracts, pooling and storing.

### Production contracts

These contracts between the producer and the buyer of the commodity (for example, a supermarket) usually cover the inputs to be supplied to the buyer, the quality and quantity of the commodity to be delivered, and price paid to the producer. The buyer typically retains ownership of the commodity (usually livestock) and has extensive control over the production process. While these contracts provide a higher degree of certainty around future income, the risk of entering into a production contract is that it can limit any innovations or changes in production processes by the producer. Also, often contracts can be terminated at short notice.

## Pooling

Price pooling arrangements are generally designed to protect the producer from fluctuating pricing of the commodity. The commodity is collectively sold to a cooperative or marketing board, which sets the price for the commodity based on a number of factors that result in an average price for all those within the group. The producer retains most of the management decisions in regard to production; however, the price, quality and quantity are agreed before delivery. Pool contracts can help reduce annual price variation by averaging price over a number of selling periods and can increase the number of export markets.

The advantages of pooling may include increased selling opportunity through collective selling and possible economies of size. One well-known pooling arrangement in Australia was the Australian Wheat Board for wheat farmers.

## Storing

For many crop farmers, storage (whether on farm or elsewhere) is a way of managing price risk. In times when increased production leads to reduced selling price, some farmers may choose to store some produce until a more favourable price can be obtained. However, when considering this method of managing price risk it is important to understand all the costs associated with storage, such as equipment costs, spoilage, labour and insurance costs.

The most effective way for producers to manage commodity risk is to undertake a portfolio approach utilising a combination of the strategies mentioned above.

# Buyers of commodities

Commodity prices can impact on businesses and consumers when producers pass on increased prices. When the cost of commodities increases for businesses buying such commodities for use in their production process, this can adversely affect profitability, pricing and supply chain processes. Where there is active price competition for a product or service, such businesses will need to manage this risk to remain competitive.

Where demand for products is elastic (demand decreases as price increases), businesses consuming commodities in their production processes must maintain efficiency in all areas of the business so they can reduce costs to offset increases in commodity prices.

Common methods used to manage commodity price risk for businesses purchasing commodities include supplier negotiation, alternative product sourcing, reviewing production processes and changing product offer.

## Supplier negotiation

An effective method of managing the price fluctuations of commodities is to approach the supplier for an alternative pricing plan. They may be able to lower prices on increased volume purchases, offer alternatives to the commodity or even suggest changes to supply chain processes.

## Alternative product sourcing

Businesses consuming commodities as part of their production process should ensure they implement procedures that allow for continual review of the production process, with particular emphasis on periodic assessment of alternative commodities for use in the process.

Alternative product sourcing can mean sourcing a new supplier or finding an alternative product as a substitute in the production process. Organisations that have strategies in place that regularly review the use of commodities within the business will be well placed to manage price risk.

## Production process review

Review of the production process can assist business in managing commodity price risk. Two key ways of improving production are to review the use of the commodities and the actual production process. For example, manufacturers of food products will continually look for improvements in the product using less of the higher priced or more volatile inputs, such as sugar or wheat. More sophisticated organisations will review production processes regularly with a view to changing the mix of products they offer and/or their production processes to offset commodity price increases.

## Changing product offer

Adopting a flexible approach to your product mix provides businesses with an effective method of managing commodity price risk. Examples include reducing the size of the product while retaining the same selling price, changing packaging to a cheaper alternative or value adding to the product to justify an increased selling price.

# Appendix 1

## Financial market instruments to manage commodity risk

This appendix provides information on how commodity hedging products can be used and when each should be considered as part of the overall commodity risk management program.

Please note: if you intend to use any of the commodity hedging products discussed below, first speak with your CPA, banker and/or commodity risk agent.

### Forward contracts

Forward contracts are agreements to purchase or sell a specified amount of a commodity on a fixed future date at a predetermined price. Physical delivery is expected and actual payment occurs at maturity (the future date agreed to in the contract). These contracts enable the seller or purchaser to lock in a fixed price for future delivery and provide protection against adverse movements in the commodity price subsequent to the contract agreement.

### Futures contracts

Futures contracts are similar to forward contracts in that they are agreements to purchase or sell a given quantity of a commodity at a predetermined price, with settlement expected to take place at a future date. However, unlike forward contracts, settlement of a futures contract does not necessarily require physical delivery. More commonly, futures contracts are traded on formal commodity exchanges and are settled by offsetting of the contract on or before maturity (the closing date of the contract) by an equivalent reverse transaction that will cancel out the original contract. This is called 'closing out' the position.

Futures contracts often carry a requirement to meet margin calls where there has been an adverse movement between the contract price and the current price — hence these contracts can impact cashflow.

### Commodity options

These options enable an entity to purchase or sell the commodity under an agreement that allows for the right but not the obligation to undertake the transaction at an agreed future date. Essentially, a commodity option insures against adverse movements in the price of the commodity. A premium (which can be relatively expensive) to undertake this transaction is usually required. There are a number of different types of options that can be used to manage commodity price risk.

### Commodity swaps

Commodity swaps are a long-term price risk management product. With swaps, producers can effectively lock in the prices they receive over the medium to long term, and buyers can fix the prices they have to pay. There is no physical delivery of the commodity; this is purely a financial transaction that is used to lock in long-term price.

Product	Purpose	Advantages	Disadvantages	Comments
<b>Forward contract</b>	Can be used to facilitate planning and budgeting by locking in a future price and a fixed date for the transaction	<ul style="list-style-type: none"> <li>• Can be tailored to specific delivery dates and quantities</li> <li>• Ensures physical delivery for both producer and consumer</li> <li>• Can be used to support feasibility of production, application for finance or pre-export finance</li> </ul>	<ul style="list-style-type: none"> <li>• Fixed contract that requires delivery</li> <li>• Credit or counterparty risk</li> <li>• Loss of profit where future price has had favourable movement at delivery</li> <li>• Pricing not transparent</li> </ul>	<ul style="list-style-type: none"> <li>• These products are provided by banks and other financiers.</li> </ul>
<b>Futures contract</b>	Used to hedge price risk without needing physical settlement	<ul style="list-style-type: none"> <li>• Contracts are standard with no need for negotiation</li> <li>• Minimal counterparty risk as futures are settled through clearing house</li> <li>• Initial position can be easily reversed</li> </ul>	<ul style="list-style-type: none"> <li>• Possible requirement to meet margin calls</li> <li>• Possible loss of profit where price at settlement is higher than futures price</li> <li>• Futures product may not match commodity being hedged</li> </ul>	<ul style="list-style-type: none"> <li>• Futures contracts are traded on formal commodity exchanges and settled using clearing houses.</li> <li>• Contracts are standardised and cannot be tailored.</li> </ul>

Product	Purpose	Advantages	Disadvantages	Comments
<b>Commodity options</b>	Used to protect against unfavourable movements in commodity price while providing some ability to participate in favourable movements in price before or at settlement date	<ul style="list-style-type: none"> <li>• Ability to take advantage of favourable movement in commodity price</li> <li>• Can be tailored to suit organisation's requirements</li> <li>• Fewer cashflow issues than futures as often margin calls are not required</li> <li>• More effective hedging product where supply is uncertain</li> </ul>	<ul style="list-style-type: none"> <li>• Premiums can be expensive</li> <li>• Usually some loss of favourable movements of commodity price</li> </ul>	<ul style="list-style-type: none"> <li>• Commodity options are available on both exchanges and over the counter from banks and other financiers.</li> </ul>
<b>Commodity swaps</b>	Used to guarantee longer term income streams from commodity and to lock in longer term pricing	<ul style="list-style-type: none"> <li>• Use of swaps can assist in obtaining finance for projects through locking in longer term pricing</li> <li>• Provides longer term hedge</li> <li>• Tailored to suit the organisation's needs</li> <li>• In some cases, no margin calls</li> </ul>	<ul style="list-style-type: none"> <li>• Counterparty risk</li> <li>• Possibility of taking advantage of favourable price movements may be lost</li> <li>• Difficult to close out</li> </ul>	<ul style="list-style-type: none"> <li>• Over-the-counter product</li> <li>• Available from banks and other financiers</li> <li>• Usually only used by larger organisations with longer term commitment</li> </ul>

# Appendix 2

## Case study

Roger is an Australian Wagyu beef farmer who exports his beef to Japan and also sells domestically. He has three types of commodity risk: beef, grain (the feed for his cattle) and fuel (getting product to market). In order to manage his profitability and cashflow, he adopts a range of commodity risk management strategies that vary each year in line with his production and inputs costs.

Roger's commodity risk policy varies depending on the price of grain and fuel. He has forward contracts with customers for the beef each year to lock in his revenue and then looks at hedging the grain and fuel (input costs) to minimise his expenses as they operate on very tight margins. He takes into account the volatility of grain pricing, competitive position and future expectations in the market.

In managing the grain risk, Roger undertakes a mix of forward buying, swaps and futures contracts. Utilising the three types of hedging enables him to manage both costs and cashflow. The futures contracts require regular margin payments, so Roger has to ensure that he has adequate cashflow to cover these margin calls. The swap contracts require upfront payment when the contract is taken and the forward buy contracts lock in the future price, which means that he has lost any potential downside to grain price on delivery. By undertaking a mix of the three strategies, he is minimising his risk to cashflow through margin calls and fixing a portion of input costs to provide some certainty over his costs.

Transportation of the beef also incurs substantial fuel costs. Roger manages this risk by negotiating fixed transport costs each year. However, there is a clause in the contracts that allows the transport company to increase the price of transport where fuel price increases more than 25 per cent of an agreed baseline price. To manage the potential increase in fuel prices, Roger seeks expert advice before entering into the fixed cost contract with suppliers to ensure that the risk of large movements above the agreed baseline price for fuel is low.

When discussing his hedging strategies, Roger points out that his overall strategy is to minimise input costs and maximise revenue. He is aware that maintaining a flexible hedging strategy can at times increase his risks. Recently,

for instance, the grain price increased from A\$240 per tonne to A\$300 per tonne over a four-week period. He had received advice that the price was going to drop and had been waiting to put cover in place, so he is now left with an unhedged position and the possibility of paying the increased price for grain.

**Key tips** that Roger believes are important when looking at commodity risk management are:

- When using futures and swap contracts, which do not entail a physical settlement, you need to ensure that the contracts mature in line with when you are taking physical delivery to avoid a mismatch that creates additional risk.
- When undertaking any hedging with third parties, ensure that you check the counterparty risk. A few years ago, one counterparty Roger had contracts with closed down and Roger was left with no hedging for that season, as well as a cash loss due to payment of margin calls before the company closed.
- Ensure you understand the risks associated with hedging. Locking in future price on revenue can lead to an increase or reduction in your competitive position.
- Do not always rely on advice from 'experts'. If you understand where your risks are, then you are probably in the best position to make your hedging strategy work for your business, after due consideration of professional advice.

