

The
Economist

GUIDE TO COMMODITIES

Producers, players and prices,
markets, consumers and trends

Caroline Bain

THE ECONOMIST IN ASSOCIATION WITH
PROFILE BOOKS LTD

Published by Profile Books Ltd
3a Exmouth House
Pine Street
London EC1R 0JH
www.profilebooks.com

Copyright © The Economist Newspaper Ltd, 2013
Text copyright © Caroline Bain, 2013

All rights reserved. Without limiting the rights under copyright reserved above, no part of this publication may be reproduced, stored in or introduced into a retrieval system, or transmitted, in any form or by any means (electronic, mechanical, photocopying, recording or otherwise), without the prior written permission of both the copyright owner and the publisher of this book.

The greatest care has been taken in compiling this book. However, no responsibility can be accepted by the publishers or compilers for the accuracy of the information presented.

Where opinion is expressed it is that of the author and does not necessarily coincide with the editorial views of The Economist Newspaper.

While every effort has been made to contact copyright-holders of material produced or cited in this book, in the case of those it has not been possible to contact successfully, the author and publishers will be glad to make amendments in further editions.

Typeset in EcoType by MacGuru Ltd
info@macguru.org.uk

Printed in Great Britain by Clays, Bungay, Suffolk

A CIP catalogue record for this book is available from the British Library

Hardback: 978 1 84668 896 6
Paperback: 978 1 84668 895 9
e-book: 978 1 84765 843 2



The paper this book is printed on is certified by the
© 1996 Forest Stewardship Council A.C. (FSC).
It is ancient-forest friendly. The printer holds FSC chain of custody SGS-COC-2061

Contents

Acknowledgements	vii
Introduction	1
Part 1 Market fundamentals	5
The economics of commodities	7
Commodities as financial assets	18
Part 2 Base and precious metals	27
Aluminium	29
Copper	41
Gold	53
Other precious metals	65
Silver	65
Platinum	70
Palladium	75
Lead	79
Nickel	90
Tin	101
Zinc	112
Part 3 Energy	123
Coal	125
Natural gas	136
Crude oil	147

Part 4 Agriculture	161
Cocoa	163
Coffee	171
Fibres	178
Cotton	178
Wool	185
Maize	191
Rice	200
Natural rubber	209
Soybeans	217
Sugar	225
Wheat	235
Glossary	245
Sources of statistical information	253
Index	257

Introduction

WE LIVE OUR LIVES surrounded by products made, in part at least, using the world's natural resources – from the clothes we wear and the food we eat to the cars we drive, the houses we live in and the electronic devices we use. We depend on commodities, and commodity consumption increases with per-head incomes as countries become more developed.

Steadily rising, although at times volatile, prices in the past decade have underlined the economic importance of commodities and how dependent we are on them. The price of gold has soared to new peaks as currencies have endured a crisis of confidence; demand from China has pushed metal prices up; instability in the Middle East and North Africa has had its effect on the oil price; and food prices have been increasing in parallel with worries about whether there is enough to feed the world.

The exploitation and refinement of natural resources have been an integral part of human and economic development. The discovery of metals and subsequent experiments that determined their potential use were the catalyst for leaps in economic development and productivity. For thousands of years, people have been exchanging and trading natural resources – agricultural products in particular – largely in marketplaces throughout the world. Traders would often go far afield to bring back goods that were not produced domestically and so would command a high price. The first formal commodity exchanges started to emerge in the mid-19th century to meet the growing demands of a rapidly industrialising United States.

Commodities have a number of unique qualities. They are typically uniform in quality and lack product differentiation. For this

reason, and unusually, there is a global price or benchmark for most commodities. Industrial commodities are usually used as inputs in the production of other goods and services, following some refining process on the raw material after extraction. Agricultural commodities are also often refined or processed in some way and are used as ingredients to make food and feedstuffs or textiles. Thus commodities are rarely bought directly by consuming households but are typically intermediate goods bought by manufacturing companies.

In its broadest sense, the word “commodity” can be used to describe any traded good (it is usually used for goods rather than services, but can be applied to both). Historically, it was also used to describe something of quality or value, but this interpretation has become largely obsolete – although it does still apply to some precious metals. In recent years, the word has spawned a number of verbs, including “commodify” and “commoditise”. The former is to make something commercially viable, while the latter is more about reducing the power of producers as goods become hard to differentiate.

This book focuses on the narrower, or perhaps purer, definition of commodities: natural resources or raw materials, whether mineral or agricultural. It looks at trends in the consumption and production of, and markets for, these goods, and at how prices have changed over the years and how they are likely to change in future. In short, it is a comprehensive guide that provides a concise explanation of everything that people need or will find helpful to know about commodities.

About this book

This book discusses commodities primarily from an economic perspective. Chapter 1 outlines the main economic issues, such as the finite nature of some commodities, whether natural resources bring economic benefits and what determines price movements. Chapter 2 expands on the recent growth in commodities as an investment asset, outlining the main financial instruments and looking at why investors would want to invest in natural resources and raw materials.

Parts 2 to 4 cover the three main types of commodities: industrial

(primarily base metals, but also some precious metals), energy and agricultural. As far as is possible, coverage of the principal commodities in each category follows a consistent pattern and includes their characteristics, how they are used, the main consumers and consumption trends, the main producers and production trends, where the commodities are traded, price developments and the broad outlook.

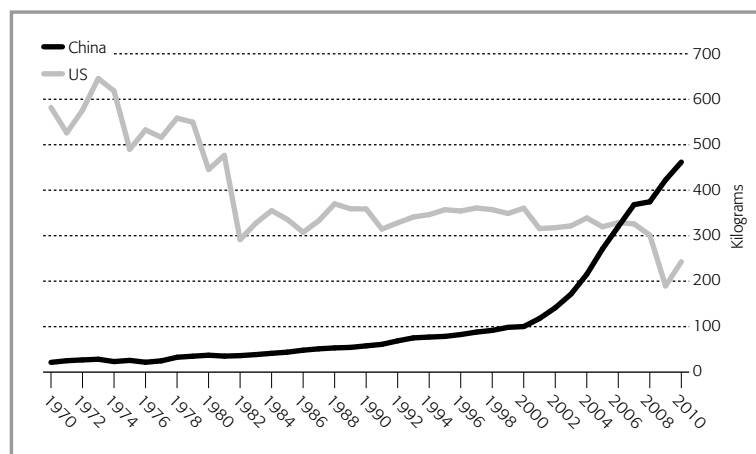
The book concludes with a glossary of terms and a list of the main sources of statistical information and research.

The economics of commodities

TYPICALLY, COUNTRIES NEED INCREASING AMOUNTS of industrial raw materials (particularly base metals) and energy as they industrialise and urbanise, and then decreasing amounts when they have reached a certain level of development and are becoming more service-sector oriented. This has undeniably been the pattern of commodity consumption in the United States and Europe. Figure 1.1 shows the quantity of steel production in the United States and China between 1970 and 2010, reflecting their different stages of development. Commodity prices and demand were weak or falling as economic growth at the time was largely concentrated in the developed world, particularly the United States, and was increasingly being driven by growth in the service sector rather than manufacturing or construction. While recent history suggests the theory holds, it is a crude maxim for estimating future trends in commodity consumption and production as it suggests that all countries will follow the same route to economic development.

In the past decade there has been rapid economic development in the developing world, particularly in China. These countries need to build transport networks, electricity grids and housing, so global commodity demand has soared. Furthermore, China opted for the traditional industrialisation route, in the process becoming the world's manufacturing centre and the largest consumer of nearly all industrial commodities (with the notable exception of oil).

FIG 1.1 Steel production per head in the US and China, 1970–2010



Sources: China's National Bureau of Statistics; US Census Bureau; World Steel Association

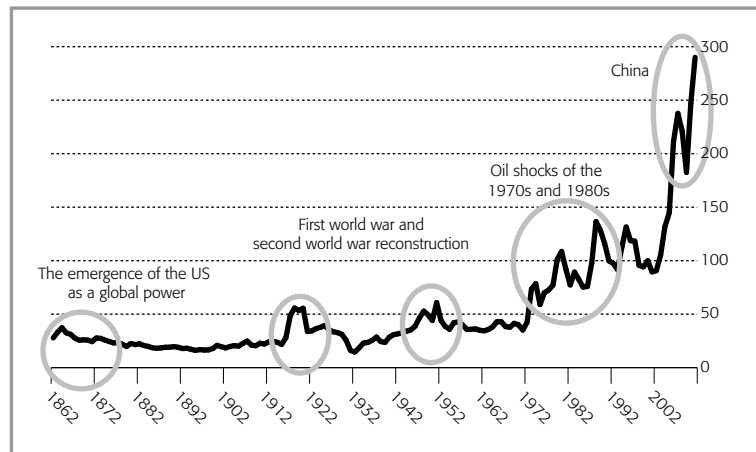
Another supercycle?

One theory that is often used to describe the recent surge in commodity demand is that we are in the midst of another commodity supercycle, one of those long waves – maybe 15–20 years or even longer – in which we move from a trough in commodity prices to a peak and back to a trough again. Typically, such waves are characterised by a fundamental or structural change in the global economy or by wars, revolutions or major technological innovations, for example in transport or communication.

Figure 1.2 shows *The Economist* industrial raw materials commodity price index going back to 1862 in nominal terms. Periods of commodity price inflation are highlighted. They coincide with structural change in the global economy starting with the industrialisation of the United States, the reconstruction of Europe and Japan after the first and second world wars, the oil shocks of the 1970s and 1980s, and ending with the industrialisation of China.

The analytical framework for supercycles was developed and expounded by two economists, among others, working separately, Nikolai Kondratiev in Russia and Joseph Schumpeter in the United

FIG 1.2 ***The Economist* industrial raw materials commodity price index**



Source: *The Economist*

States. Kondratiev outlined long waves or cycles spanning 40-60 years using commodity prices, interest rates, industrial production and external trade. His cycles involved a steady increase in economic activity coupled with low interest rates and rising prices. However, an inflexion or turning point is reached where asset price bubbles start to form, interest rates rise and economic growth slows. A final phase of the cycle involves recession or depression and an unwinding of the excesses of the earlier economic boom.

Within a supercycle you can have periods of short-term volatility, often in response to some exogenous (that is, outside the variables being considered) or unpredictable factors such as the weather or war, which can change the otherwise overriding trend in commodity prices. Schumpeter's work focused on these shorter cycles within the large supercycle.

The theory, as applied to commodities, suggests that a structural or fundamental change in the global economy – say, a war or a revolution or a major innovation in transport or communications – leads to soaring demand for natural resources. Supply fails to meet the unanticipated increase in demand, and prices rise. Supply of raw

materials then plays catch-up with demand. With most industrial raw materials, such as metals or energy, it can take years to bring new supply on stream, so there is a period of relatively high prices. By the time supply starts to meet demand, consumption may be tapering off, because following a period of rapid expansion demand growth starts to stabilise at a more sustainable level.

While economists undeniably like a theory to explain what is going on in the global economy, the theory – if you accept it – does serve a purpose. Investment decisions, particularly in the mining and energy industries, are based on a long-term outlook for demand and prices. Furthermore, countries that are rich in natural resources need to be aware of likely trends in commodity prices. However, it is easy to look back and analyse a 30-year period of high commodity prices, but much more difficult to look ahead and determine the next peak or trough.

Sceptics of the supercycle theory argue that periods of high prices are just a cyclical phenomenon, akin to the wider cycles based on fiscal and monetary policy followed by all economies. In looking at the recent decade of booming prices, it could be argued that excessively loose monetary conditions generated inflation and led to a bull market in commodities.

“Peak oil”

Another theory used to explain commodity market developments, but with a less benign outcome, focuses on the oil market and the fact that oil is a finite resource. It evolved from a paper published in 1956 by M. King Hubbert, a geologist working at a Shell research laboratory in Houston, Texas. The theory is that annual world oil supply has peaked and will be in terminal decline from now on leading to permanent upward pressure on oil prices.

Any finite resource such as oil, copper or coal follows a bell-shaped production curve, so that at some point a peak is reached and thereafter production declines. The decline mirrors the rise in production and is based on the extent of available reserves.

Implicit in this theory is that the world will engage in a scramble for these ever scarcer resources that will lead to conflict and even

wars. Until recently, it was claimed that Hubbert had successfully predicted the rise and subsequent fall of American oil production, but this can now be disputed. American oil production has started to rise again, albeit primarily from unconventional sources, and is expected to increase steadily over the next ten years. Furthermore, Hubbert's assertion that American oil production would peak in 2000 proved to be false.

One of the problems with the peak oil theory has been that both technology and prices were held constant in the original model. High oil prices and technological advances have made the extraction of oil from unconventional fields technically possible and economically viable. Breakthroughs in technology are also making it possible to exploit conventional resources that were previously impossible to extract.

Nevertheless, there is increasing awareness that many industrial raw materials are finite resources, which has led to increases in the recycling of metals and efforts at energy conservation. The peak oil theory is perhaps the most extreme manifestation of security of supply fears related to the world's relationship with commodities (see below).

Security of supply fears

Geopolitical tensions throughout history can often be traced back to efforts to secure natural resources, and the rise of resource nationalism (countries seeking to ensure that national resources are not exploited by foreign powers or multinational companies) has added to worries about a reliance on imported natural resources. Since the second world war, many countries have sought to be as self-sufficient as possible; this was evident in the 1950s development model in South America and still prevails in China, which seeks self-sufficiency in most basic foods. Compounding these "security" fears is the fact that many natural resources - notably all hydrocarbons and metals - are finite. Standard trade theory may suggest that countries should produce the goods in which they have a comparative advantage and then trade with other countries, but nation states feel vulnerable when they have to import what they consider essentials.

As a result, both food security and energy security are highly politicised and, in the case of the latter, have been an active component of foreign policy in some resource-scarce countries. In the past decade, countries exporting agricultural commodities have imposed trade restrictions when they have had bad harvests; Middle Eastern countries with limited water supplies have bought tracts of land or invested in countries with agricultural potential; and China has made massive investments in resource-rich countries, particularly in Africa. These are all attempts to ensure supplies of essential natural resources for domestic consumption. Fears about disruption to supply can have a strong influence on commodity prices.

Producer action

The often geographically concentrated nature of supply of many of the world's resources, for example the massive silver and copper belt spanning the Americas and the tin-producing region of South-East Asia, means there is considerable scope for the small number of producers to be powerful players in determining prices. During the 20th century, however, numerous attempts by producing countries to set prices, such as the International Coffee Agreement and the International Natural Rubber Agreement, fell apart. The only cartel-like body that has managed to survive and wield considerable power in the market is the Organisation of Petroleum Exporting Countries (OPEC), which now accounts for about 40% of global oil supply.

OPEC tries to set a target for output that it deems will meet oil-market needs but not lead to a fall in prices (unless oil prices are soaring unsustainably). The organisation has had a chequered history and mixed success. It cannot penalise member states that flout their targets and choose to free ride on the prevailing OPEC policy, and only one member state, Saudi Arabia, has the capacity to act as a swing producer and raise its output significantly in order to affect prices. Another problem is that producers can dictate only one side of the commodity trade: supply, a relatively blunt tool.

Are resources a blessing?

Resource-poor countries may fret about being reliant on the need to import what are deemed “strategic” goods, but economic history suggests that it is not always a blessing to be a resource-rich country. On the face of it, countries with sought-after resources have an advantage. They can use the resources for their own economic development (without fears about supply) and export the remainder, ideally at an attractive price. However, some of the wealthiest countries in terms of natural resources are the weakest in terms of gross national income or development.

One of the reasons for this is that the resource sector can crowd out the rest of the economy. Valuable resources, particularly if they attract a high international price (such as oil in recent years), may mean there is less incentive to develop other parts of the economy. Furthermore, the rich vein of commodity exports, and possibly the foreign investment that the country’s resource attracts, may lead to exchange-rate appreciation, making the country’s other exports less competitive and encouraging imports (again removing the incentive for developing domestic capacity). Another problem is that, aside from agriculture, the resource sector can be a small employer (mining, forestry and energy), and thus the sector does not contribute significantly to wider economic growth. During the 1970s, this phenomenon was labelled “Dutch disease” by *The Economist* in an article examining the decline in the Netherlands’ manufacturing sector as a result of exchange-rate appreciation following a massive natural gas find in the 1950s.

Developing countries also worry that the economic benefits of the exploitation of their resources will go disproportionately to the foreign firms whose expertise is necessary to exploit them. Hence the rise of “resource nationalism” and an awareness of the pitfalls of being commodity rich, which has led many resource-rich countries to operate large sovereign wealth funds, keeping excess liquidity out of the domestic economy and preventing all the receipts from going into government current expenditure. Efforts are also being made to invest windfall revenue in human and physical capital.

A further problem for resource-rich countries is starting to be