



# Commodity Trade and Finance

Michael N. Tamvakis

# COMMODITY TRADE AND FINANCE

BY

MICHAEL N. TAMVAKIS

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COMMODITY TRADE  
AND FINANCE

## About the Author

Michael N. Tamvakis trained as an economist at the Athens University of Economics and Business in Greece. He then joined the International Centre for Shipping, Trade and Finance at the (then) City University Business School; first as a student on its MSc programme, and then as a member of its academic staff. He received his PhD from City and he is currently Professor of Commodity Economics and Finance at Cass Business School, City University. He lectures in international commodity trade, commodity risk management and shipping economics. His research interests are in the areas of commodity economics, energy derivatives and shipping economics.

*To Rebecca and Nicholas*

## PREFACE

“Merchants have no country. The mere spot they stand on does not constitute so strong an attachment as that from which they draw their gains.”

THOMAS JEFFERSON (1743–1826)

In today’s world, which is dominated by commercial transactions, it may be difficult to imagine a society without any exchange of goods; where individuals satisfy their consumption needs without any resort to goods produced elsewhere and traded in some form of organised market. The history of the world’s great civilisations may on the surface be about glorious achievements in culture, science or war, but it has always been underlined by the need to seek new resources and trade. Not surprisingly, some of the commodities traded today have been traded from the beginning of civilisation. Wheat, oil, wine, copper, tin and spices have been traded for thousands of years, although their importance has changed in line with the needs of the parties engaging in their exchange.

The history of the world can be seen through the needs of its peoples: the need to survive the elements, to earn sustenance from livestock and crops, and to source raw materials through trade (but also often through war). From the Phoenician and Greek traders in the Mediterranean Sea, Arab merchants in the Middle and Far East, the Hanseatic League, and the Portuguese and Spanish voyages of discovery, to the Dutch and English mastery of world trade, history offers us plentiful examples of how trade has been central to the growth and expansion of all great civilisations. History may not “repeat itself”, but trade remains a recurring theme in the life of *homo economicus*.

During the 19th and 20th centuries the growth of trade, both in raw materials and manufactured goods, has been phenomenal. Basic commodities are still essential for all nations, developed and developing, despite leaps in technology and science. As individuals we have essential needs which can only be satisfied by commodities: oil, grains and metals. At the beginning of the 21st century the world is concerned, now more than ever, with the increasing difficulty of finding new natural resources, and bringing them to the market. We may also be increasingly concerned with the impact our activities have on the environment, but this has not stopped us from consuming ever increasing quantities of raw materials and finished goods. At the time of writing, the price of oil is approaching \$100 per barrel; copper prices have hit new all-time highs; and grain prices cause markets to be excited again. Commodities are attracting, once again, our undivided global attention.

This book takes a closer look at several of the major commodities traded today. Some of them, like oil, are undisputed leaders, both in terms of the volume and the value of trade they generate. Others, like rubber, are less dominant, but still important in our everyday lives. The book is essentially split into three main sections: energy, metals, and agriculture. Gas and coal

complement the extended coverage given to oil. Iron and steel, copper and aluminium are the three most important base metals which feature in the second section. The material on agriculture focuses on grains and soft commodities, with forest products and rubber offering a taste of other agricultural commodities which have more industry-based applications.

There are several other commodities which have been omitted from this book, mostly due to the space available. Some of them may emerge in possible future editions, but the 12 chapters included here are, I believe, a solid start for the student of commodities, whether at university or in business.

I was introduced to the fascinating world of commodities when I first joined the International Centre for Shipping, Trade and Finance at Cass Business School, as a student on its MSc course. It was the first time that I had the chance to study such a multitude of goods which form part of our everyday life, even though they attract our attention only in times of crisis.

Since then, I have had the pleasure to lecture in International Commodity Trade for a number of years, and I thought it would be timely to organise the plethora of facts and figures about these commodities into a more coherent set of writings. The original idea behind this emanated from Professor Martin Stopford, who was the first academic to bring all these commodities under the same umbrella; to him I am indebted for his valuable teaching and for providing the inspiration for this book.

My gratitude also goes to all the staff at the Centre, especially Professor Costas Th. Grammenos for his guidance and support throughout the years, both as a teacher and as a colleague, and Gladys Parish who undertook the onerous task of reading through the drafts and straightening my anarchic punctuation. Finally my thanks go to Bharat Bhargava for his contribution in Chapter 9.

As usual, all errors and omissions remain with the author.

Michael N. Tamvakis  
*November 2007*



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## CHAPTER 1

# FUNDAMENTALS OF ENERGY MARKETS

“... our [society] has become a Hydrocarbon Society and we,  
in the language of anthropologists, Hydrocarbon Man.”

DANIEL YERGIN

## INTRODUCTION

We start with the largest and most important (by value and volume) group of commodities – energy – which is absolutely central to modern industrial societies. The aim of this chapter is to lay the foundations for the study of energy commodities by elaborating on the economics of demand for, and supply of, exhaustible energy resources. The role and cross-substitutability of alternative energy resources will also be discussed, subsequent chapters will elaborate on the three main commodities in this group: oil, natural gas and coal.

## MEASUREMENT

Before proceeding with the specifics of energy supply and demand, it is worth having a look at the different ways used to measure energy.

From a physicist’s point of view energy is measured in standard units, irrespective of the source from which it originates. Several such units are in use, including BTUs (British Thermal Units), therms, calories and joules. Unfortunately, for a non-specialist these measurement units do not convert very well. When transport logistics come in the picture, volume and weight measurement units are much more relevant than calorific units. In most sources of energy statistics, energy resources are quoted in metric tonnes. However, a tonne of oil does not produce the same energy as a tonne of coal or a tonne of gas. It is, therefore, customary to quote energy resources in “equivalent” units. So primary energy consumption is measured in “tonnes of oil equivalent” (toe). A few decades back it was tonnes of coal equivalent (tce) that were used, due to the predominance of coal in world primary consumption.

Using tonnes still presents problems when measuring natural gas. It is more common to use cubic metres or cubic feet instead. When adding up different sources of energy, however, the toe is still used.

Finally, nuclear energy and hydroelectric power cannot be quantified in tonnes; it is their electricity-generating capacity that is used as a common basis for measurement (see Table 1 overleaf).

Although the toe is an acceptable common measurement unit for the purposes of studying and comparing all energy resources, individual commodities have been customarily measured in their own units.