

PRESIDENT'S MESSAGE

Orlando Conference

Thanks to Mary Barcella and Mine Yucel, and their first-rate program committee, the Orlando conference is now ready to go. The program can be downloaded from the IAEE website, www.iaee.org. There are two new things this year: seminars by Bill Leffler and Steve Connors on petroleum refining and electricity (respectively), for those members who wish to brush up on their technical knowledge; and a closing retrospective by John Boatwright, Laney Littlejohn, and Onic Marashian. The first two know it all, and the latter three have seen it all.

Given the turmoil in the profession, Orlando is definitely the place to be. Want to know what deregulation will be like in the 21st century? Come hear Paula Rosput, President and COO of Atlanta Gas Light Company. Interested in the transformation of independent oil companies? Robert H. Campbell, Chairman and COO of Sunoco will slake your curiosity. Wondering about energy policy? Michael Telson has your answers.

And beyond that, there are two general sessions, six dual general sessions, and twenty-nine concurrent sessions, covering everything from Alternative Fuel Vehicles to Whither Oil Prices? If you don't get the answers to your questions at this conference, you should meet somebody who can get them for you.

The Long-term Future of the Association

Overall, the Association is operating well and progress is being made on many fronts (more below), but in this case, the devil may not be in the details, but in the overview. Although I am skeptical about those who constantly urge organizations to "reinvent" themselves or urge continuous "reengineering", nonetheless, it is vital for us to be constantly moving forward. In many ways, we are doing so, but there are times when it seems that our focus is more short-term than a day-trader's.

The Evolution of the Profession

Once upon a time, energy companies all had big economic departments, with lots of staff, a large travel budget and a chief economist held in awe by his or her fellows. Governments couldn't hire energy economists fast enough, and academics merely had to include the word energy in the title of a paper to get it accepted by a prestigious journal. Anyone with a tie and an opinion about oil prices could get a plane ticket and an honorarium faster than you could say "energy czar".

Now, people fear the title "chief economist" as being automatically prelude to "ex-chief economist". Mergers

aside, many companies have decided that they either can't or don't want to generate long-term forecasts and therefore don't need an economics department. All data are available from the web, and any expertise they need can be hired from a consulting company, mostly populated with their former employees.

Is There a Role for a Professional Society of Energy Economists?

In the next newsletter, I will give my views on the nature of the profession, but for now, the topic at hand is the role of the Association. It would be legitimate, I think, to ask why energy economists should have their own society instead of joining NABE, the SPE or the AEA. But I would counter that there is no other place where we are so welcome. For example, the American Economics Association will have one panel on energy at its upcoming meeting, academic journals largely ignore resource economics, and in groups like NABE, we are but one subfield among many.

But also, there is (or should be) a substantial connection between our various subfields. Without question, an academic resource economist may seem to have little in common with a strategic planner for a utility or a regulatory lawyer, and yet, close examination reveals that nearly every researcher has some connection with nearly every other one. Long-term resource availability affects fuel prices to utilities, utility strategic management is a major factor in environmental mitigation, and choices of environmental tactics affect business in the production and consumption of energy.

The professional turmoil we see now is a major reason for a group like the Association. Many members find themselves changing jobs, companies, and even industries, but still working in related fields. The best way to keep in touch (or get in touch) with both people and the latest research is through a centralized group such as ours. Whether you go from an oil company to a consulting firm, a university to an IEP, or a think tank to a corporate planning

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Editor's Corner

This issue of *Dialogue* includes an excellent article by Ed Krapels on the impact of trading funds on national economies and on energy prices. Ed apologized for the length of the article, explaining that he didn't have time to write a shorter one. I think you will find it very interesting reading!

(continued on page 2)

President's Message (continued from page 1)

department, the Association provides the best way to remain connected to the field. And given that many of these changes are, ahem, unplanned, having membership in the Association should be a standard part of every professional's portfolio.

Is the Association Keeping up?

Our organization primarily consists of chapters, which are essentially independent, an annual North American Conference, an academic journal (IAEE published) and a newsletter. Although a number of new programs have been instituted at all levels, no major operational changes have occurred in our twenty year history, even as our profession has evolved enormously. It is not clear that we are either providing what the current members want or attracting everyone we should be to membership.

Recently, we have instituted several new programs intended to address this problem, including a student scholarship fund (very successful) and a chapter development fund, which hasn't been used much even though it represents free money for the chapters. We will imminently have our own website, just a step behind such technologically advanced groups like FARC, the Colombian rebel movement, and it should improve communications among members, chapters and the USAEE, as well as providing some services. (More on that when it is operational.)

But the Association is also in the process of considering ways both to serve the membership better and to reach out to potential members more effectively. The latter seems vital, since we are woefully underrepresented in many areas. Ten states have no members at all, and there are fewer members in the Southeast than in Colorado. (A major reason why our upcoming meeting is in Orlando.) This appears to be a marketing problem more than a quality of service problem.

Additionally, though, the Association, having gone through its birthing pains, now should consider what it wants to do with itself, focussing on two main questions. (I think, but I am open to outside opinions.) First, who are our members and who should they be? At present, the Association consists of academics, corporate planners, and government policy-makers and regulators. Is the organization as currently constituted appropriate, or should there be more effort to reach out to environmentalists, lawyers and/or brokers? Or would that divert our purpose and dilute our core membership? Second, given a new (or merely confirmed) definition of our mission and makeup, do our services need to be expanded? Should there be more regional meetings, greater assistance to chapter meetings, an expanded newsletter, or other things I haven't thought of?

I have asked Council (and some others) to meet and discuss these questions in Orlando, but welcome input from any and all members. Recognizing that many of you are happy to be in the silent majority, and that a scientific survey is too expensive for our group, nonetheless I would like to hear opinions about the above questions, or any others you wish to share.

Mike Lynch
Wilfrid@mit.edu

Editor's Corner (continued from page 1)

Also included is an informative article by Douglas B. Reynolds of the University of Alaska at Fairbanks on the potential for growth in the demand for oil to overwhelm the ability of producers to supply.

Please join me in thanking the authors for their contributions to our newsletter.

Please send new articles (or suggestions for articles) and notices for publication in *Dialogue*. Include news of chapter events and appropriate press releases. Items can be sent via E-mail (paul-roberts@worldnet.att.net), by Fax (713-207-9962), or by regular mail (Reliant Energy, Incorporated, P.O. Box 1700, Houston TX 77251-1700). If you have questions, comments, or suggestions, I can be reached by phone at 713-207-5059.

Paul Roberts

Energy Puzzler for July/August: Oil Prices and the Economy

Even without worrying about the Y2K problem, is the U.S. economy slated for an oil demand crunching recession to start the millennium?

Since early 1999, crude oil prices have jumped from about \$11-\$12 per barrel to about \$20, an increase of approximately 75%. According to a macroeconomic model developed by Hamilton and Mork, nine out of eleven U.S. recessions over the last 50 years were preceded by a large energy (oil) price increase approximately 9 months beforehand.

Should this bit of economic history be ignored? Should OPEC care? This oil price rise was from a very depressed level. Furthermore, oil's impact on GDP in many consuming countries is not as large now as it was in the 1960's and 1970's. Inflation and interest rate problems do not seem to loom over the markets as they did before prior slowdowns.

As you lie on the beach or hike the mountains, please give this some thought. Then, if you would like to comment on our Energy Puzzler, send a note to: adam.sieminski@db.com. As usual, we will compile and send out the responses, identifying job functions, but not names or companies. Thanks. Please feel free to pass this along to a colleague who might be interested.

Adam E. Sieminski

USAEE Nominations Announced

Dr. Leonard L. Coburn, Past President of USAEE and Chair of the 2000 Nominations Committee is pleased to announce the following slate of nominees for USAEE Officer and Council positions:

2000 Elections

| | |
|------------------------------|----------------------|
| For President Elect | Michelle Michot Foss |
| Vice President - Conferences | Andre Plourde |
| Vice President - Chapters | Marianne S. Kah |
| Secretary-Treasurer | Arnold B. Baker |
| Council Member | Lynn McAlister |
| Council Member | Mine K. Yucel |

Other USAEE Officer and Council members for the 2000 calendar year will include Michael Lynch, David DeAngelo, Foster Mellen and Wilfrid Kohl.

!!! THERE'S STILL TIME TO REGISTER !!!

The Structure of the Energy Industries: The Only Constant is Change

20th USAEE/IAEE Annual North American Conference – August 29 – September 1, 1999
Orlando, Florida, USA – Hilton at Walt Disney World Village

If you're concerned about the future of the energy industry and profession, this is one meeting you surely don't want to miss. The 20th USAEE/IAEE Annual North American Conference will detail current developments within the energy field so that you come away with a better sense of energy supply, demand and price. Some of the major conference themes and topics are as follows:

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| Oil Industry Restructuring | The Climate Change Debate |
| Natural Gas Markets in the New Century | Electricity Restructuring |
| Global Gas & Power | Alternative Fuel Vehicles |
| The Global Economy and its Effect on the Energy Industry | |

Economic upheaval, globalization, privatization and regulatory reform are having significant impacts on energy markets throughout the world. All of the major energy industries are restructuring through mergers, acquisitions, unbundling and rebundling of energy and other services. This conference will provide a forum for discussion of the constantly changing structure of the energy industries, with insights into the causes and likely outcomes of the restructuring efforts that are now underway.

At this time, confirmed speakers include the following:

J. Christopher Allen, Reliant Energy Wholesale Group
 Mark Bernstein, RAND Corporation
 Robert Campbell, Chairman & CEO, Sunoco, Inc.
 Joe Foster, CEO, Newfield Exploration
 Luis Eduardo Giusti, CSIS
 Karl Georg Jechoutek, World Bank
 Jim Katzer, Mobil Oil
 Prakash Loungani, IMF
 Terrance McGill, Columbia Gulf Transmission Company
 Knut Anton Mork, Svenska Handelsbanken
 Adam Sieminski, BT Alex Brown, Inc.
 Kyle Simpson, Morgan Meguire, LLC
 Michael L. Telson, CFO, U.S. Department of Energy

Brad Bates, Ford Motor Company
 Stephen P. Brown, Federal Reserve Bank of Dallas
 Tom Cackette, California Air Resources Board
 Herman Fransenn, Petroleum Economics Limited
 William W. Hogan, Harvard University
 John Jurewitz, Southern California Edison Company
 Ram Khatti, Valero
 Michael C. Lynch, MIT
 David Montgomery, Charles River Associates
 Paula Rospud, Atlanta Gas Light Company
 Matt Simmons, Simmons & Company
 Ronald Sutherland, American Petroleum Institute
 Barbara Laflin Trest, Bechtel Corporation

A special added feature of this year's conference is designed to contribute to our understanding of the technical underpinnings of energy markets. On Sunday, August 29, the conference will offer two one-hour tutorials – one entitled "Petroleum Refining for the Non-technical Person" presented by William Leffler (Shell Oil Company) and a second on "The Basics of Electricity" by Stephen Connors (MIT). The closing session is entitled "Looking Ahead by Looking Back." We have brought together three energy industry wise men, John Boatwright, Laney Littlejohn and Onnic Marashian to evaluate current energy market developments against the backdrop of their combined experience in the energy industries.

In addition, 29 concurrent sessions are planned to address timely topics that affect all of us specializing in the field of energy economics. Sessions confirmed include:

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| Energy Financing Practices and Innovations | Modeling Electricity | Energy, Sustainability & Market Transformation |
| Modeling Greenhouse Gas Emissions | Electricity Deregulation in Canada: The State of Play | Energy Policy Issues |
| The Future of the Oil Industry: A Scenario Discussion | U.S. Energy Policy: Should We Have One? | Designing Competitive Electricity Markets |
| Implications for the Kyoto Protocol | Power Markets in Developing Economies | Oil and Gas Industry Restructuring |
| Gas Regulation and Environmental Issues | Renewable Sources of Energy | Converging Gas and Power Markets |
| | Distributed Generation | |

The 20th USAEE/IAEE Annual North American Conference provides a unique opportunity for leading experts from business, government, universities, and research institutions to discuss and debate the future of energy markets in this era of commodization, decentralization, and internationalization. The meeting will emphasize the applicability of the most recent, cutting-edge analysis for helping private and public organizations frame decisions and choose appropriate strategies.

Orlando, Florida is a wonderful and scenic/tourist place to meet. Single nights at the Hilton Hotel are \$139.00 (contact the Hilton Hotel at 407-827-4000, to make your reservations). Conference registration fees are \$525.00 for USAEE/IAEE members and \$625.00 for non-members. Special airfares have been arranged through Continental Airlines. Please contact Continental by calling 281-821-9549 and reference our discount code "IMBGHT." These prices make it affordable for you to attend a conference that will keep you abreast of the issues that are now being addressed on the energy frontier.

There are many ways you and your organization may become involved with this important conference. You may wish to attend for your own professional benefit, your company may wish to become a sponsor or exhibitor at the meeting whereby it would receive broad recognition or you may wish to be considered as a presenter at the meeting. For further information on these opportunities, please fill out the form below and return to USAEE/IAEE Headquarters.

The Structure of the Energy Industries: The Only Constant is Change

20th Annual North American Conference of the USAEE/IAEE

Please send me further information on the subject checked below regarding the August 29 – September 1, 1999 USAEE/IAEE Conference.

Registration Information Sponsorship Information Exhibit Information Speaker Information

NAME: _____
 TITLE: _____
 COMPANY: _____
 ADDRESS: _____
 COUNTRY: _____ Phone/Fax: _____

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Deregulation and the Rise of Speculators in World Markets: The Good, The Bad and the Useful

By Edward N. Krapels*

Malaysian Prime Minister Mahathir Muhammed blames the collapse of Malaysia's economy at least in part on foreign currency speculators. In an interview with *Time* magazine, Mahathir complained that speculator Funds' "ability to undermine the currency is such that we cannot do anything to help us recover. Anything we do in the direction of recovery is seen as wrong and will cause a loss of confidence. And when they say we have lost their confidence, they then push the value of the currency and push down the value of the shares."¹ Consequently, Mahathir took the bold gamble of decoupling Malaysia from international currency markets: the ringgit is no longer a tradable currency.

Mahathir is not the only one worried about speculators. Even George Soros, whose currency speculation was the target of Mahathir's wrath last summer, told the Committee on Banking of the U.S. House of Representatives in September that "the global economy which has been responsible for the remarkable prosperity of this country [the United States] in the last decade is coming apart at the seams." The free flow of capital to markets providing the highest return, Soros argued, is no longer the engine of economic growth: "Financial markets are given to excesses . . . Instead of acting like a pendulum, financial markets have recently acted more like a wrecking ball, knocking over one economy after another." Most of the excesses in the financial markets are the result of aggressive trading by specialized Funds, including, of course, Mr. Soros' own Quantum Fund.

Are they right? Is it time to rein in the Funds? Yes, it is. The current combination of excess capital in the hands of highly adventurous Funds, the way in which these Funds leverage that capital into enormous positions in futures, swaps, and other derivatives markets, and the relative innocence about these forces in much of the newly industrializing world is too explosive to last.

In searching for ways to dampen the excessive influence of the Funds, however, great care must be taken not to overly damage the constructive, indeed vital, role that speculators play in modern international markets. Thus, while Fund activity may be constrained by devices such as increasing margin payments on futures market investment, Fund activity should not be restricted otherwise. To the contrary, Funds actually help the capitalist system police itself by insisting that countries desiring their inflows of investment comport themselves according to the US-centered Rules of the Game.

A complicated array of international markets exerts an unprecedented influence on the value of the bonds that finance government activities, of the equities that hold the majority of individuals' wealth, of the currencies of almost all countries involved in world trade, and of the price of critical commodities like oil. Is this a problem, as Mahathir would have us believe, or is it part and parcel of the global capitalist system? After all, should investors not be free to withdraw their funds as they

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please? Is that not part of the "tough love" of free markets?

The Flow of Funds

There has always been a flow of money across borders. Traditionally, that flow only financed the global trade of physical goods. Today's flow of funds, however, has increased exponentially from the rather modest amounts it takes to finance physical trade. Today's flow of funds is driven by the trade in financial instruments themselves: stocks, bonds, futures contracts, options, and derivatives. In some of these markets, the volume of trade is pumped up by the ability of traders to leverage their financial position: for example, in the Eurodollar futures market, an individual investor can take on a million dollar obligation with a margin payment of only \$3,000.

With the wide array of contracts and assorted rules on leveraging trades, international financial markets have become so complicated that even the saviest investors feel out of their depth. But there are ways of getting a grasp on these markets. One key to getting a clear picture is to distinguish between the stock of wealth in each country and the flow of funds between countries. In every economy, wealth is held in the form of land, precious metals, goods, and financial instruments like stocks, bonds, currency holdings, and futures contracts. The stock of wealth, on a global scale, has to be tallied in the tens of trillions of dollars. The largest shares are in the United States, Japan, and Western Europe.²

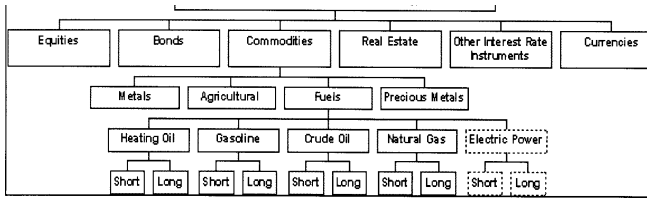
If the stock of global wealth can be measured in the tens of trillions of dollars, the flow of funds, which no single institution measures systematically, must amount to several trillions of dollars over the course of a year. Thus, a Japanese investor may sell his real estate in Tokyo in order to buy stocks in Malaysia, or U.S. Treasury Bills, or crude oil futures contracts, or a trunk-full of gold or silver. He may also deposit his funds in a bank, which then makes loans, engages in swaps, and sells futures and options in the over the counter markets.

This intricate web of investments, loans, and derivatives has grown exponentially over the last ten years. Parts of this web are always under some pressure. There is almost always a small meltdown somewhere. Recently, however, the meltdowns have gotten bigger. Last year, Asian equity, real estate, and currency markets collapsed. More recently, Russian and Malaysian financial institutions essentially defaulted on their derivative obligations. As Soros told the Banking Committee, a systemic bank failure was avoided only by the prompt action of central banks in other countries.

The problems are not only abroad, however. In late September, 1998, reports began to circulate of a successful effort by the New York Federal Reserve Bank to orchestrate a \$3.5 billion bailout of a hedge fund (Long Term Capital). According to new reports, "Wall Street's biggest power brokers agreed to prop up one of their most aggressive offspring, Long-Term Capital Management, L.P., a highflying hedge fund that was on the verge of collapse."³ According to the Wall Street Journal, one of the "hotly debated topics" in the meeting that reached the accord to bail out the Fund was that its failure "would put the entire financial system at risk" because the Fund had leveraged its several billion dollars of investment capital into a market position that at times exceeded \$100 billion.

What is happening here? Have we reached the point where speculators are simply too powerful? Does something need to be done? To answer that question, we must first define the flow of funds more concretely.

Figure 1
The Trillion Dollar Trading System



Hundreds of Streams

The international flow of funds – sketched out in Figure 1 above – is in no way centrally directed; to the contrary, it is best regarded as hundreds of streams with ultra-complex interconnections.

The largest stream in the flow of funds is in equity investments. Investors eager to diversify from the equity markets in their own country are placing more and more money in a rapidly growing number of international equity funds. These funds give the investor a wide array of choices of geographic risk (“The Asia Fund”) and level-of-development risk (“The Emerging Market Fund”). The volume of cross-border equity investment is hard to pin down. For the G-7 countries, gross foreign direct investment has increased from \$14 billion in 1970 to \$450 billion in 1997; cross-border portfolio investment has grown from \$5 billion in 1970 to \$1 trillion in 1997.⁴

Not surprisingly, developing countries look at these equity capital inflows with both dread and longing. Many welcome the investment that capital inflows enable. But as the Asian stock market meltdown has shown, the outflow of

foreign capital can bring economic growth to a screeching halt.

Such an outflow hit the economies of Southeast Asia particularly hard in late 1997. Thailand, Malaysia, the Philippines, Indonesia and even Singapore had achieved high rates of economic growth because they had invited in foreign capital. When that capital fled, the disinvestment effects were powerful: the decline in foreign demand for southeast Asian stocks ultimately sent Asian GDP growth figures from the black into the red. The risk of a region-wide depression will remain high for another year or two.

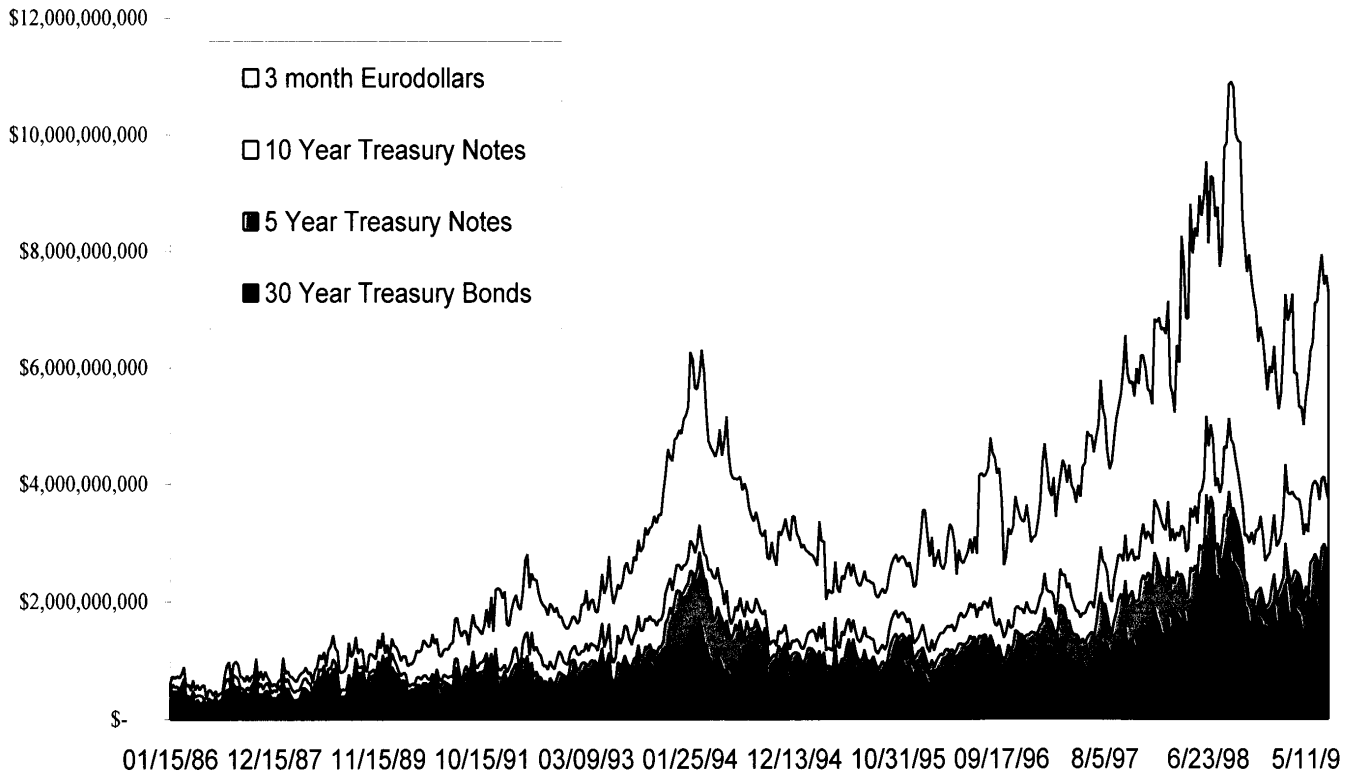
A second large stream in the flow of funds is investment in bond markets. Over the past few decades, a number of changes have facilitated the growth of international bond trading. Japan’s massive trade surpluses practically required placement of hundreds of billions of dollars in the deepest of the bond markets, US Treasuries. The consolidation of the European financial affairs led to tremendous growth in Euro-dollar denominated bond market.

As with the case of equities, the magnitude of the flow of funds into bonds is a matter of the gravest concern. For almost a decade, the Treasury Department has dreaded the prospect of a sudden liquidation of Japan’s position in U.S. government bonds. Such a liquidation, in turn, would be a decision that could only be made by Japan’s head of state. As is the case with the flow of funds into equities, financial markets intuitively understand that a sudden change in the flow will affect the relative prices of the bonds being traded. Thus, a sell-off by Japan of US Treasuries would put downward prices on US bond rates, quite apart from any change in the underlying fundamentals of US government bonds (such as an increase

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Figure 2

Speculator Funds in a Selected Group of Interest Rate Futures (Net Long or New Short) in \$000



Source: ESAI database on Commodity Positions based on CFTC raw data.

Deregulation and Speculators (continued from page 5)

in US government borrowing requirements).⁵

The Flow of Funds into Currencies and Interest Rates: Try Trillions

When assets are subject to US-organized futures market trading, an extremely valuable source of information becomes available which describes the movement of funds by professional speculators. This is the Commitment of Traders Report of the U.S. Commodities Future Trading Commission. The COT reports are issued every other week, and they reveal the long and short positions of large traders in all U.S. futures markets.

Figure 2 presents a timeline of the total commitment of large traders who speculate (from now on, we will call these "The Funds") in the U.S. interest rate markets which have associated futures markets: treasury bills, notes and bonds, and Eurodollars. The financial commitment of the Funds (measured as the total financial value of the long and short contracts held) amounted, as the chart shows, to some \$10 trillion. Because futures trade is a margin business, however, the actual financial investment by the Funds is much, much less than \$10 trillion. In Eurodollars, for example, the margin payment on a million dollar contract is only \$3,000. If that margin applied to all interest rate contracts (in fact they vary), the Funds' investment in these instruments would be "only" \$300 billion. To put even this number in a more realistic context, the net of the Funds' long and short positions as of June 23, 1998 was \$1.3 trillion in gross, notional contract terms. 3 percent of that is \$40 billion, which is probably the best estimate of the actual investment capital the Funds had tied up in the U.S. Eurodollar futures contract traded in the Chicago Mercantile Exchange.

Currency trading is also a beehive of activity. In 1986, the turnover (on spot, outright forward, and foreign exchange swap transactions) in foreign currency trading was \$188 billion, equivalent to 7 percent of world exports. In 1995, it was \$1.2 trillion, equivalent to 20 percent of world exports.⁶

Because interest rates and currency values (which we can for these purposes lump together with interest rate markets) are quite volatile (compared with some other investments like real estate), it is extremely convenient to make one's investment in this category via the financial instruments instead of in the underlying asset itself (such as a T-bill or ownership of foreign currency deposits in foreign countries). As a result, the multi-trillion dollar volume of trading and the open interest in this asset class dwarfs that of all other classes.

Sudden changes in investors' preferences moves prices in this asset class, just as it does in equities or bonds. 1997 presented outstanding examples of fund managers disillusioned with the values of assets in Southeast Asian countries. The financial meltdown in this region is likely to have begun in the currency markets. Traders in the Thai baht and the Malaysian ringitt had been short-selling these currencies through much of 1997. Gradually, their assault eroded the value of these currencies to levels that began to affect the interests of foreign investors holding baht and ringitt-denominated assets. As the equity fund managers began to cash in their Thai and Malaysian asset holdings, they increased demand for dollars and decreased demand for the local currency, and downward pressure on the currency intensified. In such bear markets for a currency, the price movements sometimes become stampedes, as holders of the domestic currency panic.

Figure 3 shows the pattern of Fund short-selling of the Japanese yen from its peak at 80 yen per dollar in 1995 to its trough of 145 yen to the dollar in the summer of 1998. This

Figure 3
Japanese Yen: Non-Commercial Positions 1997 to 1999

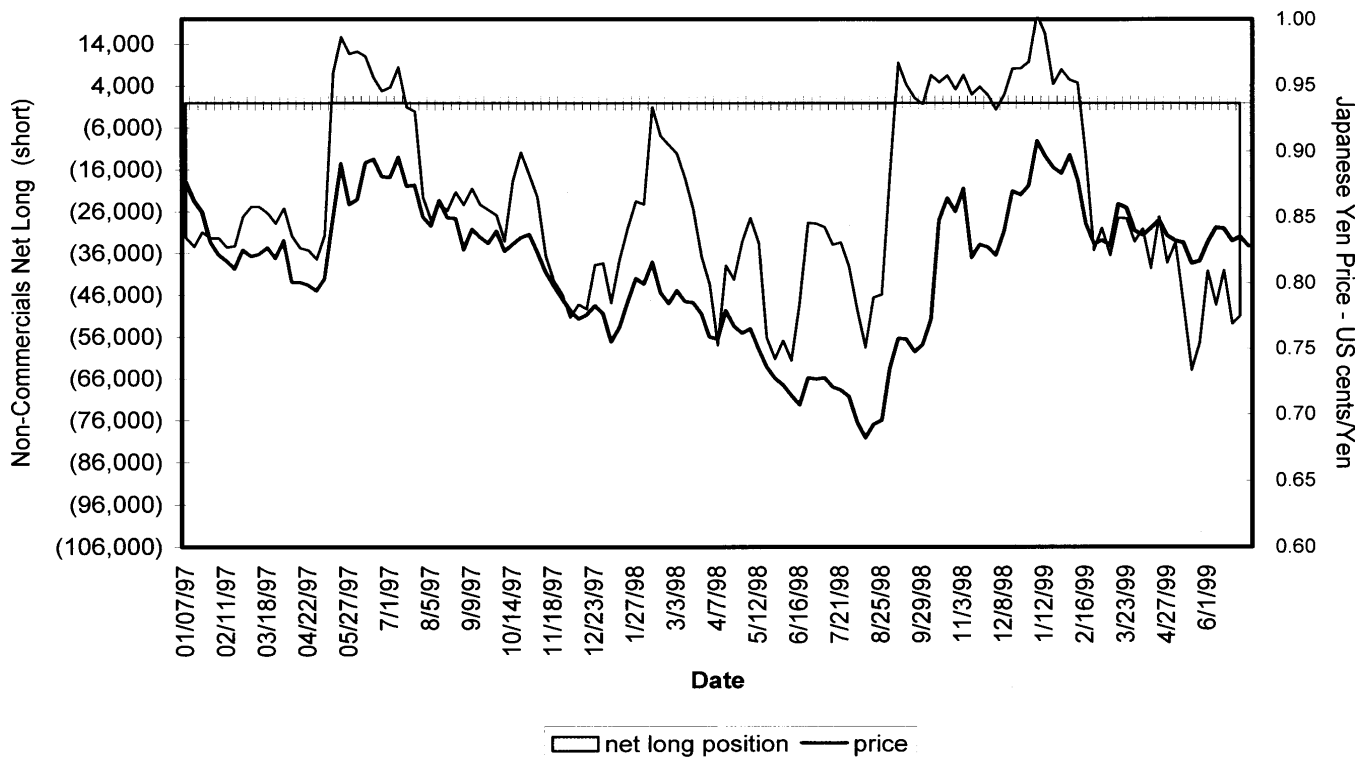
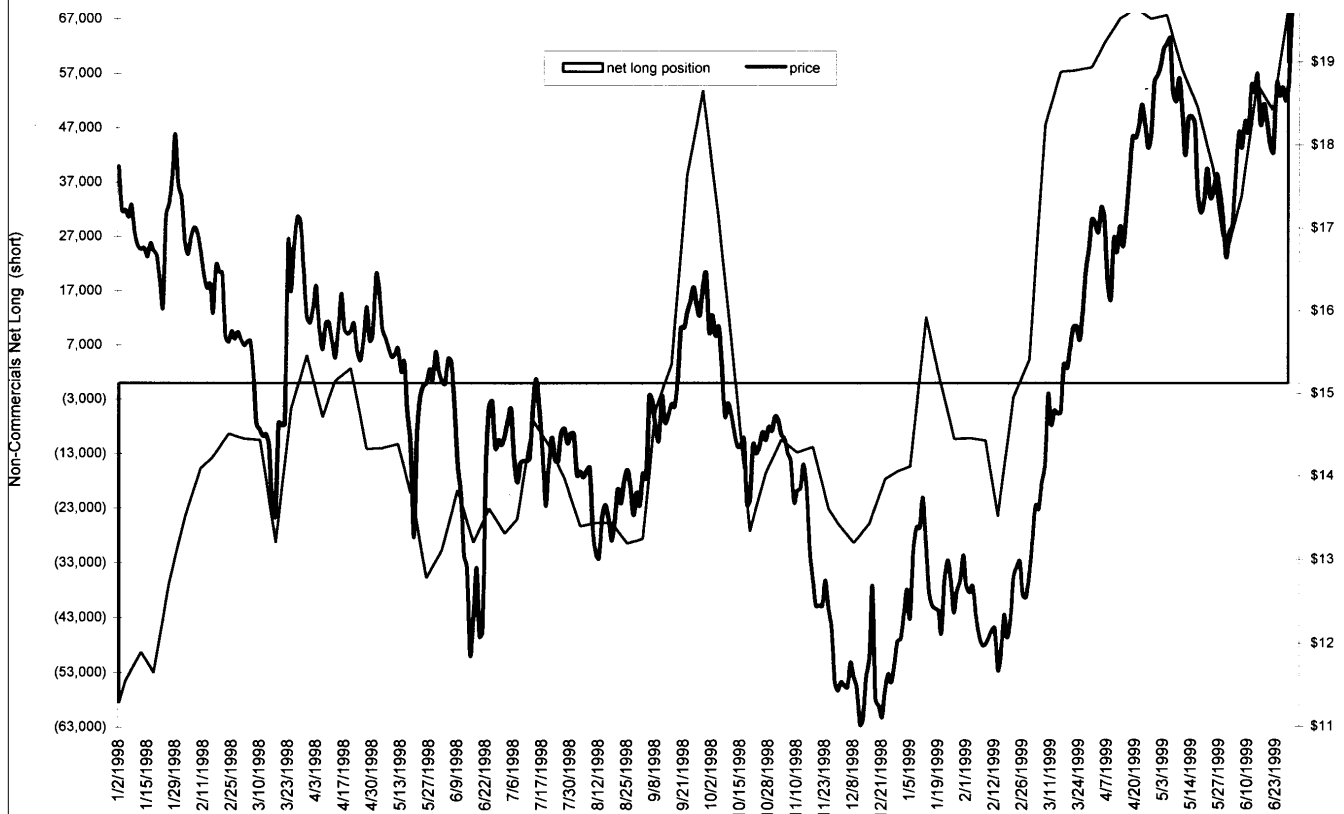


Figure 4
Crude Oil: NonCommercial Net Long (Short) Positions



particular market is one of the deepest and most liquid in the world, and one should not expect speculators to be able to dominate it as easily as smaller markets. Nevertheless, there are indications that systematic and large-scale short-selling of the yen during peak periods such as May and August 1998 influence the price even in this massive market. One can safely assume that a systematic and large scale attack on smaller currency markets will have significantly more direct impacts on the value of the currency.⁷

Southeast Asia learned in 1997 that the ups and downs of market forces are untidy and unforgiving. Prime Minister Mahathir reacted angrily to what he saw as the assault on his country's currency, blaming the international hedge funds in general and speculator George Soros in particular for Malaysia's sudden turn of fortunes.

The Flow of Funds into Commodities

Finally, there is an international flow of funds into commodities. Like currencies, commodity markets have been ideal spawning grounds for the development of futures markets. There is a certain irony in the fact that commodity futures markets, which have a reputation for rowdiness, are in fact highly organized and regulated entities. Be that as it may, once a successful futures market for commodities is up and running, it becomes the nexus of price discovery for that commodity.

For example, in 1984, the New York Mercantile Exchange (NYMEX) introduced a contract to trade West Texas Intermediate (WTI) crude oil. Had NYMEX launched the WTI contract in the 1970s, when the members of the Organization of Petroleum Exporting Countries were running a fairly effective oil cartel, and most oil-importing

countries were still regulating their internal oil markets, the contract would have failed. But NYMEX was both skillful and lucky to introduce the contract three years after the United States and Britain totally deregulated their oil markets and one year before OPEC's effective oligopoly collapsed.

Trading in WTI, and in its first cousin, the London-traded Brent crude oil contract, rapidly gained volume and open interest. Today, it is safe to say that world oil prices are strongly influenced by trading in the pits of the exchanges, while OPEC's role has diminished. As financial contracts, WTI and Brent provide investors with convenient and highly liquid markets in which to trade crude oil. Before this process of commoditization of oil took place, only insiders (professional traders, oil companies, and a few investment banks) could trade multimillion dollar cargoes of oil. After NYMEX introduced the WTI contract, anyone with \$2,500 in the bank could take a bet on oil prices.

Figure 4 shows the relationship between the net long (when the shaded areas of the graph are above the x-axis) and the net short (shaded area below the x-axis) positions of the non-commercials and the price of crude oil in the futures market (represented by the solid line, with values on the secondary-axis). Analysis indicates there is more than a random connection: oil prices tend to decline when non-commercials go from a net long to a net short position; oil prices tend to rise when they go from a net short to a net long position.

Wherever the Flow of Funds Goes, it Affects Prices

How does this apparent connection work? Oil provides

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Deregulation and Speculators *(continued from page 7)*

a useful explanation. In the physical oil market, prices are set by the supply and demand for the physical commodity. Given a set of competitive supply and demand conditions, as demand rises, all other things held constant, prices tend to rise; if supply rises, prices tend to fall, and so on.

Exactly the same can be said for financial or "paper" markets. If we think for the time being of an oil financial contract as an asset in its own right, it stands to reason that an increase in demand for paper barrels (which in futures parlance would be called an increase in the demand for "long" positions) would, all other things held constant, require an increase in prices to attract an offsetting number of sellers (holders of short positions) into the market.

In a similar way, changes in the demand and supply for any financial asset affect the prices of those assets. The United States is in the sixth year of a stock market boom characterized by huge inflows of funds into stocks. Should there be a prolonged outflow of funds from the market, there would almost surely be a decline in the same stock prices that the inflows have sent zooming upwards.

Sudden increases in the demand for other assets are similarly likely to put upward pressure on those asset prices. Take the case of the yen: if investors suddenly want to be long the yen, the price of the yen is likely to rise until enough investors find it economically desirable to go short the yen. In this manner, the flow of funds into currencies can have unanticipated – and to governments unwelcome – impacts on the currency values.

As the size of the international flow of funds has grown over the past decade, the influence of sudden shifts in that flow on asset prices has grown stronger. Put another way, the strength of the influence of the flow of funds on the prices of many commodities and currencies has increased relative to the strength of the influence of the "fundamentals" of those commodities.

The Commitment of Traders

How do we know what the Funds are doing? Unfortunately, their operations in many markets remain opaque, except to the most inside of insiders in financial markets. Fortunately, in the United States futures markets, there is a bit more light. The United States is now the home of many of the world's most vibrant futures markets. The Commodities Futures Trading Commission is responsible for regulating these markets, and among the reports it issues is one on the Commitment of Traders.

In these biweekly reports, the CFTC publishes data from futures brokers categorizing traders as "commercials", "non-commercials", and non-reporting traders. The commercials are those who take futures positions for hedging purposes. Thus, an oil company that is hedging physical production would be called a commercial. A non-commercial is a non-hedger whose contracts exceed a certain number: in the case of oil, the threshold is 300 contracts, which in today's market represents a face value of approximately \$5 million. Thus, the speculating private citizen is not likely to be in this group. He is going to be in a third category – the small trader – and simply lumped into the "non-reporting" category.

It is logical to assume that commercials use futures markets at a steady and ratable pace. An oil producer, for example, is likely to have a hedging program that entails

taking a rather steady number of futures positions over time. Non-commercials, on the other hand, are likely to use futures markets in a less steady and predictable pace. They are likely to swoop into the market when they feel the conditions are becoming ripe, and to sweep out of the market when conditions have ripened. When they do that, they affect prices.

The Flow of Funds, Crony Capitalism, and Performance Gaps

If this is an accurate model of how Funds affect prices, what are the benefits and costs of their growing clout? In some circles, of course, there is a knee-jerk reaction against speculators. More thoughtful people realize, along with Frank Knight, "that every act of production is a speculation in the relative value of money and the good produced."⁸ Professional speculators, whether organized as hedge funds or on their own, lend liquidity to markets without which the markets would be much less efficient. Speculators naturally arise when risk that was formerly borne by a higher financial authority comes to affect the decisions of individual investors, corporations, and individuals. Speculation, in other words, thrives when economies are deregulated. Markets are deregulated, in turn, when political actors believe that market forces will contribute more to public welfare than government regulations.

The deregulation of oil presents a good case study of the perceived long-run benefits of deregulation of markets in general. In the traditional annals of world trade, crude oil always held a special place because it was deemed to be critical to national security. That was one of the reasons why most importing countries regulated their internal oil markets, established national oil companies (British Petroleum and France's Elf both started their corporate lives as national champions in the international oil scene), and sought bilateral oil deals with exporting countries.

Conservative governments in the United States and Great Britain shattered this tradition in the early 1980s, setting in its place a philosophy that deregulation would ultimately lead to more efficient markets. Both governments recognized that oil was still a strategic commodity, but they rejected the traditional argument that oil's strategic importance justified comprehensive regulation of the domestic oil market and the domestic oil industry.

This was an important paradigm shift, but it was not accepted in all countries at once. Oil regulations were gradually relaxed in most European countries, but to this day the internal markets of the majority of countries of Asia, Latin America, the Middle East, and Africa are still regulated. In Japan, for example, the Ministry of International Trade and Industry (MITI) continued to regulate internal prices, the flow of petroleum product imports and exports, and the construction of refineries and other oil facilities. This comprehensive regulation of the internal oil market continued to be justified on the basis of "national security".

Over time, the traditional linkage between oil security concerns and the comprehensive regulation of internal markets has come undone. It has become clearer and clearer that the underlying reason for regulation of internal markets in Asia and elsewhere is not security. Instead, it is part of the fabric of crony capitalism. Governments naturally find it easier to control a small number of domestic operators than

the global community of investors.

Thus, using oil again as an example, MITI has had a cheek-to-jowl relationship with Japanese oil companies for decades. MITI regulators looked after the profit margins of the companies, and, as the most successful MITI officials reached retirement age, some of them were allowed, in Japanese phraseology, to "descend into heaven" from their low-paying government jobs to lucrative positions in the senior management of their former charges in the industry.

While these arrangements have undoubtedly been beneficial to the government officials and oil companies shareholders, they imposed a burden on the national economy. The continuation of regulation in Japan while the American and European oil markets opened up created a performance gap between their respective oil companies.

Japanese oil refining and marketing companies are grossly inefficient, requiring some of the highest margins in the world to stay afloat. The American and European companies, meanwhile, have become world-class competitors, providing petroleum products to their customers at prices much lower (even after the varying oil excise taxes are taken into account) than Japanese consumers have to pay.

Regulation perpetuated inefficiency in the Japanese oil sector. At the end of the day, Japanese consumers paid for that inefficiency. We estimate that, on average, the margins Japanese oil refiners require to produce refined petroleum products are twice as large as those required in the United States.

In the United States, deregulation forced oil processing margins to fall, giving the rest of the U.S. economy an efficiency boost. In Japan, continued regulation kept processing margins high, depriving the rest of the Japanese economy from that efficiency boost. Money that American consumers once had to pay to inefficient oil refining companies is now free to stimulate demand in other sectors. Money that Japanese consumers continued to pay to inefficient oil refining companies was not free to stimulate demand in other sectors; instead, it was trapped in the bowels of organizations who required three times the number of people (compared to their American counterparts) to process and sell a barrel of gasoline.

It is now clear that deregulation improves efficiency. Nothing is free, however. The cost governments pay for this efficiency improvement is loss of control over prices.

With deregulation, international markets determine domestic prices. Again using oil as an example, now that Japan has begun to deregulate its internal oil market, the prices of petroleum products in Japan are going to be determined by the prices of petroleum products in the world markets.

World market determination of internal prices is typically a death-knell for the crony capitalism that has been held responsible for so many of Asia's economic problems. Companies exposed to international market forces have to change their focus from actions that promote their welfare in the old protected system to actions that make them internationally competitive in the brave new world of market capitalism.

In short, the formerly protected companies have to learn how world markets work. One of the key lessons that must be absorbed is that the flow of international money into and out of an asset has a big influence over the price of that asset.

Who Understands The Influence of the Flow of Funds on Asset Prices?

Denizens of the financial community have a derisory term for investments by those who do not understand the increasingly complex machinations of financial markets: they call it "stupid money." There is stupid money everywhere. In the world of commodity trading, the smart money is first of all in the investment banks of Wall Street, London, and a few other European financial centers. There is deemed to be a lot of stupid money in Asia. The Japanese are regarded as especially inept in commodity markets, largely because their tradition of government regulation prevents anyone from establishing meaningful Asian-based markets. Thus, when Japanese traders do try to trade in Atlantic-centered markets, they tend to do very poorly.

The strength of particular investment banks varies across commodities. In oil, Morgan Stanley, Goldman Sachs, and Salomon Brothers are particularly active. In many of oil's side products (say, gasoline, or diesel oil) one of the banks will not just be a trader, it will be the market, the final place where many of the positions that companies and speculators trade finally winds up. The banks develop over time a "book" in a particular commodity or financial asset, a compilation of long and short positions that the bank's own risk managers will constantly scrutinize for balance and for unwanted exposure.

The larger investment banks have over time built up "books of books" or portfolios of financial assets, and they will study the price correlation between these assets for balance or imbalance. For example, they may find that crude oil and soybean prices tend to statistically move together. A trader may want to exploit this analytical information for gains, but the risk manager may see overexposure to the two commodities together as a real problem. He will look for negative correlations, and seek to have books of assets that move up when crude oil and soybeans move up.

The development of these books by investment banks over the last decade is one of the most important developments in international finance. As the books have grown, so has the intensity of the analytical efforts. It is not an exaggeration to say that investment banks can make good use of supercomputers: they are in the process of analyzing the correlation of everything – from sunspots to El Niño to Federal Reserve Meetings – with the prices of the financial assets in which they trade.

Who Are the Funds?

If the investment banks provide the channels of international commodity, currency, and other derivatives trade, "The Funds" provide the bulk of the speculative money. As suggested in Figure 2, the amount of "non-commercial" (i.e., speculators large enough to take multi-million dollar exposures in futures markets) money in futures markets has increased dramatically in the last ten years.

This increase reflects in part the torrent of investment capital that is increasingly free to move through financial markets, and it reflects in part the phenomenon of increased numbers of qualified fund managers and commodity trading advisors. Money management, after all, is one of the growth industries of the 1990s. The general public is familiar with what one might call the "plain vanilla" funds – the mutual

(continued on page 10)

Deregulation and Speculators *(continued from page 9)*

funds into which the bulk of pension savings goes. But mutual funds are only peripherally involved in the dynamics of the futures managers, after all, have a fiduciary obligation to conserve the capital of their clients. Thus, they confine their investments largely to the equity sector, where price changes – while quite spectacular in historical terms during the 1990s – are hohum compared to the typical commodity price volatility.

The heart of speculative commodity and currency trading is in hedge funds and commodity pool operators who manage money – typically for wealthy clients or for institutions who have earmarked some of their funds for speculative purposes.⁹ These managers have no fiduciary obligation, and are paid to speculate intelligently in one or more markets where they believe they have the expertise to trade for profit. Among the best-know fund managers are George Soros and Paul Tudor Jones.

The central requirement of a hedge fund manager or a commodity pool operator is a trading system that makes profits. Of the hundreds of fund managers and commodity traders, the vast majority are “systems traders,” relying upon the analysis of price trends for their trading decisions, and paying little if any attention to the fundamentals of the market in which they are trading.

In this corner of the financial community, there is a never-ending search for new technical systems that allow traders to earn the requisite return on capital. Many if not most of the systems are aimed at finding hitherto unknown arbitrage opportunities. Many of the systems are derivations of classical mathematical analyses, from probability density curves to Monte Carlo simulations of future price movements.

Collectively, the trading decisions of what we will call the purely financial community – investment banks and speculators – exert the influence over prices that was displayed in the representative chart in Figure 2. Within the analytical community that studies these questions, there is a debate over how frequently the financial community leads price changes in a given market, and how often it lags changes instigated by the “fundamentals” in that market.

Alas, in the most rigorous terms, causality cannot be proven, it can only be inferred. That is why it is hard to definitively answer Malaysian Prime Minister Mohamed’s complaint: did “the Funds” cause the collapse of Malaysia’s market? Not likely, but they may well have caused the market collapse to proceed more rapidly than it otherwise would have.

Similarly, did “the Funds” cause the price of oil to collapse in late 1997? Did they cause the value of the Malaysian ringitt and the Japanese yen to fall? We can never know for sure, but we certainly do know that the Funds liquidated their massive long (price-supportive) positions and increased their short positions in oil and in the yen at about the time that their prices began their long and drastic descent.

Markets in Turmoil

We believe organized speculators now affect the value of almost everything involved in world trade. No one would object to this if only soft drink prices were affected by their activities. But when they drive up the price of the fuels that keep people from freezing, of the equities that hold the store

of wealth of savers, and of the currencies that determine a nation’s stature in world affairs, it is no wonder that we hear trading that is at the heart of our story. Mutual fund cries of alarm from government officials. Malaysian Prime Minister Mahathir is by no means the first nor will he be the last to complain about the market power of “the Funds” and of unscrupulous traders.

But the power of speculators cannot be eliminated without throwing the baby – the efficacy of market forces – out with the bath water. Government officials and most well-informed market participants are aware that markets cannot thrive without the depth and liquidity speculators add to markets, without speculators to embrace the risk that others shun, and without speculators’ restless pursuit of new financial instruments that – in spite of all of the concern about derivatives – still promote financial flexibility and creativity. In short, speculators make markets work better, albeit at a cost.

The cost, as the academic literature has begun to recognize but as practitioners in financial markets have long known in their bones, is volatility. Free markets with a high concentration of professional speculators (holding, say, up to 20 percent of the market’s open interest) tend to exhibit significant price volatility. In the short run, say, over a couple of months or at most a few years, this volatility is inconvenient and even painful to those on the wrong side of the price cycle. Thus, the relatively high oil price of 1996 was painful for consumers, the low price of 1998 for producers.

In the long run, however, we find that commodity prices and exchange rates in freely traded markets tend to return to an economically rational levels. Thus, oil prices – thought in the late 1970’s and early 1980’s to be on a constantly rising path – in fact show a remarkable propensity to return to a very long-term average level or around \$15 per barrel. Thus, the yen, which in the early 1990’s looked capable of reaching parity with the dollar, has now descended from heaven back to earth.

Volatility is part and parcel of markets. It is the measure of the market’s attempt to equilibrate. We believe that hedge funds often add to volatility, and that the most direct and effective measure would be to reduce their leverage by increasing the margin requirements in exchange traded markets. Thus, to revert to the Eurodollar market example with which we began, the margin on that million dollar contract could be raised by, say, 20 percent, and still be only \$700 per contract. Funds and exchanges, of course, will resist this suggestion because it would adversely affect the liquidity of their markets. And so it would, but if this segment of the financial community does not regulate itself more effectively, chances increase that governments will ultimately regulate them out of existence.

It would be a disaster to regulate speculators – even well-organized ones – out of existence via government-run price management programs. Need we even say that experiments of this sort have been conducted, and that the results were disastrous. We are now in the early stages of a grand experiment to truly apply market forces globally, and we shall see whether early complaints – among them Prime Minister Mahathir’s – are leading signals of re-regulation or lagging signals of the old guard. Only time will tell.

But it behooves the defenders of the new status quo – market economists, investment bankers, and Fund managers

– to do everything they can to shed maximum light on these markets. There is still an astonishing lack of disclosure of some of the information that helps makes market forces explicable. For example, only the American futures markets are required to collect commitment of traders data: all futures markets should do so. Such vital market information as petroleum inventory levels are still not published in a timely basis by the leading oil producing countries. Saudi Arabia, the world's largest oil producer, fails to publish any timely details of its operations.

Thriving markets have an insatiable appetite for information. The general public in newly market-oriented countries will continue to regard markets as distant and dangerous places. It is up to governments – the same ones that have surrendered their controls to the market – to ensure that adequate flows of information exist to feed the markets to whom they have entrusted their fates. Governments who import commodities – from oil to diamonds to soybeans – must insist that those who supply them commodities – whether it be Saudi Arabia or South Africa or the United States – practice maximum disclosure of information.

In the long run, markets are useful if they are open to the participation of small and large speculators, not dominated by cliques or cabals, and rich in information. Today's great international markets – Treasury bills, major currencies, crude oil, wheat, gold – while certainly influenced by speculators, are not dominated by them. The care and feeding of such deep and liquid international markets is now where the attention of governments should be focused.

Footnotes

¹ Available on the World Wide Web at http://cgi.pathfinder.com/time/asia/magazine/1998/980615/malaysia_interview4.html

² For a valuable summary, see *International Capital Markets: Developments, Prospects, and Key Policy Issues*, International Monetary Fund, (a Staff Team led by Charles Adams, Donald J. Mathieson, Garry Schinasi, and Bankim Chadha). Available on the World Wide Web at <http://www.imf.org/external/pubs/ft/icm/icm98/index.htm>

³ "A Hedge Fund Falter, and Big Banks Agree to

Ante Up \$3.5 billion," *Wall Street Journal*, September 24, 1998, p. A-1.

⁴ IMF, *International Capital Markets: Developments, Prospects, and Key Policy Issues*, p. 187.

⁵ The third area of cross-national investment is real estate. By its very nature, the flows into and out of this market tend to be the least volatile. Real estate investment by, say, Dutch pension funds into Washington, DC office buildings, once done, is not easy to undo. Real estate investments tend to be made by managers of funds with the greatest fiduciary restrictions and tend to be for the long term. On the fringe, there are financial instruments (like Real Estate Investment Trusts) that facilitate purely financial investment but the big money is still in physical assets. Because real estate prices tend to be among the least volatile among the asset classes, the demand for financial instruments that manage that volatility is – compared with interest rates, currencies, and commodities – fairly small.

⁶ IMF, *International Capital Markets: Developments, Prospects, and Key Policy Issues*, p. 190.

⁷ This chart tracks the value of the yen (the line) with the net of the long and short positions of non-commercials (which we assume are largely institutional speculators). When the area chart is below the zero line on the left Y axis, the Funds are net short; when it is above the line, they are net long. The raw data on non-commercials' position are taken from the Commodity Futures Trading Commission's Commitment of Traders report.

⁸ As quoted in Peter L. Bernstein, *Against the Gods: The Remarkable Story of Risk*, (New York: John Wiley & Sons, 1996, p. 305.

⁹ Hedge funds are misnamed: they are actually funds registered under special Securities and Exchange Commission rules that limit the number of investors to 99 etc. US-based Commodity Trading Advisors (CTA's) and Commodity Pool Operators (CPO's) are registered with the Commodity Futures Trading Commission. In addition to US-based funds, of course, there are hundreds if not thousands of off-shore funds operating under the regulations of their home countries or under no regulations at all.

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Oil Scarcity Should Be a Concern

By Douglas B. Reynolds*

It is easy to say that oil prices have come down and therefore they will stay down for a long time or that oil production in some areas of the world has increased and therefore it will continue to increase for a long time. What is harder to say is why oil prices ever went up in the first place and why they went up at the exact time that they did rather than another time. If it were possible to say why oil price changes happened when they did, though, then it would be easier to forecast future oil supplies and prices. That forecast is shown below.

First of all, instead of looking at oil prices by themselves, consider looking at oil supply and demand separately, especially demand. Before 1973, what was happening to demand? It was actually increasing at 7% per year world-wide. While most of that increase represents U.S. and European consumption, it still shows a pattern for how a country like the U.S. or any other country emerges from a mostly agrarian economy into an industrial economy. In other words, almost any emerging economy would have that high of increase in demand. At any rate, after the first oil shock, world demand declined some and then increased at about 4.5% per year. Then finally, after the second oil shock in 1979, oil demand declined again and then started to increase at a more modest 1% to 2% per year. If oil demand had continued its pre 1973 rate of increase, today's oil demand would be about 275 million barrels of oil per day. Even if the more modest pre 1979 world increase continued, we would still need about 135 million barrels per day today. Does any one really believe that oil prices would be as low as they are today if oil demand was that high? Of course not! Considering the oil price shock during the gulf war in 1991 when a mere 17 million barrels per day were threatened to be cut off, it is hard to believe oil prices would be as low as they are today without the change in demand trends in the 1970's. Those changes in demand trends have resulted in a reduction of about 50 to 200 million barrels of oil per day. Therefore, the biggest reason oil prices are low today is because demand is low, not because supply is high.

Considering the above analysis, it seems a little unjustified to claim that greater oil supplies are why oil prices are so low today. Nevertheless, the question remains: why is demand so low? Why did the trend change? Most analysts believe that greater technology has been the major cause. To a degree, that is correct. However, much of the slowing in demand has come from electric utilities and residential heat users switching energy sources to use non-oil fuels. Having electric power or residential heat use switch to non-oil fuels though is not really new technology, merely an alternative allocation of resources. However, now that these reallocations of energy fuels have been employed, there is no longer much potential to save oil in these uses. On the other hand, core uses of oil have not changed all that much especially transportation uses. It will be much harder in the future to reduce oil use by conserving fuel in these uses.

Furthermore, much of the slowdown in world oil demand

can be attributed to the world recession in the early 1980's, the fall of communism in Europe and Asia in the early 1990s, and more recently a major recession in East Asia and the rest of the developing world. These situations are hardly justification for a continued long term slowing of oil demand. However, the receding economic growth in East Asia, Russia and the rest of the emerging markets will not continue forever. They will rise again. Furthermore, if these countries were to use the same oil per capita as the U.S. or, for that matter, even Europe, then world demand for oil could easily top 250 to 450 million barrels per day. No one can believe that world supplies could possibly sustain such a huge demand. Prices would push exceedingly high.

It may take a long time before developing countries demand a lot of oil. Yet it is often emerging economies that grow the fastest. What is more, emerging markets tend to increase their demand for oil faster than their GDP growth. If GDP should grow at 10% per year as China has attained, then oil demand could grow as high as 12% per year as Korea and Japan showed in their early development stages. This is due to emerging markets creating a rapidly developing new lower middle class with a high demand for automobiles. What difference will it make if non-OPEC oil production can increase at 3% per year with that kind of surging oil demand?

However, oil supply analysis has also been faulty. In 1962, Dr. M. King Hubbert (1962) made a prediction of lower 48 oil production. He predicted that U.S. lower 48 oil production would reach a peak in 1969 and decline thereafter. Everyone scoffed at him. Yet, he was right on. U.S. oil production peaked in 1970 very close to his prediction and has subsequently declined as he thought. Currently projected Ultimately Recoverable Reserves (URR) for the lower 48 so far looks to be within 100% of Hubbert's original estimate. Current oil production is also within 100% of Hubbert's prediction for this year. That is quite close seeing as he made his prediction over 35 years ago and that the shape and general direction of supplies is consistently following his predicted path. What is more, 35 years of technological progress has made remarkably little difference in changing U.S. supplies. Most analysts see 100% more oil and believe technology is very strong, yet the ability to consume has far outpaced a mere change in the rate of declining production. A 100% increase in URR has a much smaller affect than it looks on actual supplies since that doubling of URR is carried out over a very long time horizon. For example, the U.S. imports more than 50% of its oil needs and that is only expected to increase despite any better oil production changes. Dr. Hubbert also predicted world URR but he did that before the peak in world discovery rates. Now that we have reached the peak in world discovery rates, it is much easier to predict the total, which looks to be about 2.4 trillion barrels.

Some might argue that the only reason world oil discovery rates are so low is because OPEC countries are not exploring much for oil. However, OPEC derives its market power not only from cutting production of oil, but also by cutting exploration of oil too. Another reason cited for the lack of exploration is poor local regulation, usually too much regulation, in many emerging market oil producing countries. However, whether discovery rates are low due to poor local regulation regimes or lack of effort by OPEC or whatever, the fact of the matter is discovery rates are lower than production rates and there does not look to be any change in that on the horizon. Even when prices were high, discovery rates were low and declining.

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Never the less, what has happened in the U.S. will happen to the rest of the world. In the U.S., even with the best technology available and new oil fields in Alaska and even though we have one of the most competitive, fairly adjudicated property right, free markets on Earth, oil production has decreased since 1970. This suggests that technology or market innovation will not by itself be a very big factor in increasing world oil supplies above its currently predicted total.

Looking at supply and demand together for the world, we again ask why did oil prices jump so high exactly in 1973 and 1979? Why not at some other time? Was it all because of some Arab/Israeli conflict? Or a revolution in Iran? Or was there a more fundamental reason? In Figure 1 is a Hubbert curve graphed in terms of cumulative production rather than time. This version of the Hubbert curve can be derived easily from Hubbert's original logistics function by substituting the time variable between his production and cumulative production equations. The top curve is a Hubbert supply potential for the world at any given cumulative production using URR of 2.4 trillion barrels and parameters similar to the U.S. and Russia. The second curve is a Hubbert supply curve cut back by OPEC market power to squeeze supply potential. Finally the bottom curve is the historic and projected oil demand also in terms of cumulative production. The projected oil demand is based on a modest 2.4% increase in demand per year which will happen once the Asia crisis has subsided.

Notice that the real reason for the oil price shocks is because world demand pushes up against the OPEC supply potential. This would have happened no matter what happened in the politics of the Middle East. Both the 1973 and the 1979 price shocks were a direct result of demand pressing against OPEC supply potential, not politics. The scary part is what will happen when the next crossing is slated to occur. When next the demand pushes up against supply, supply will no longer be on an upward trend, but a downward trend. It will be the mother of all oil shocks. Even if the predicted 2.4

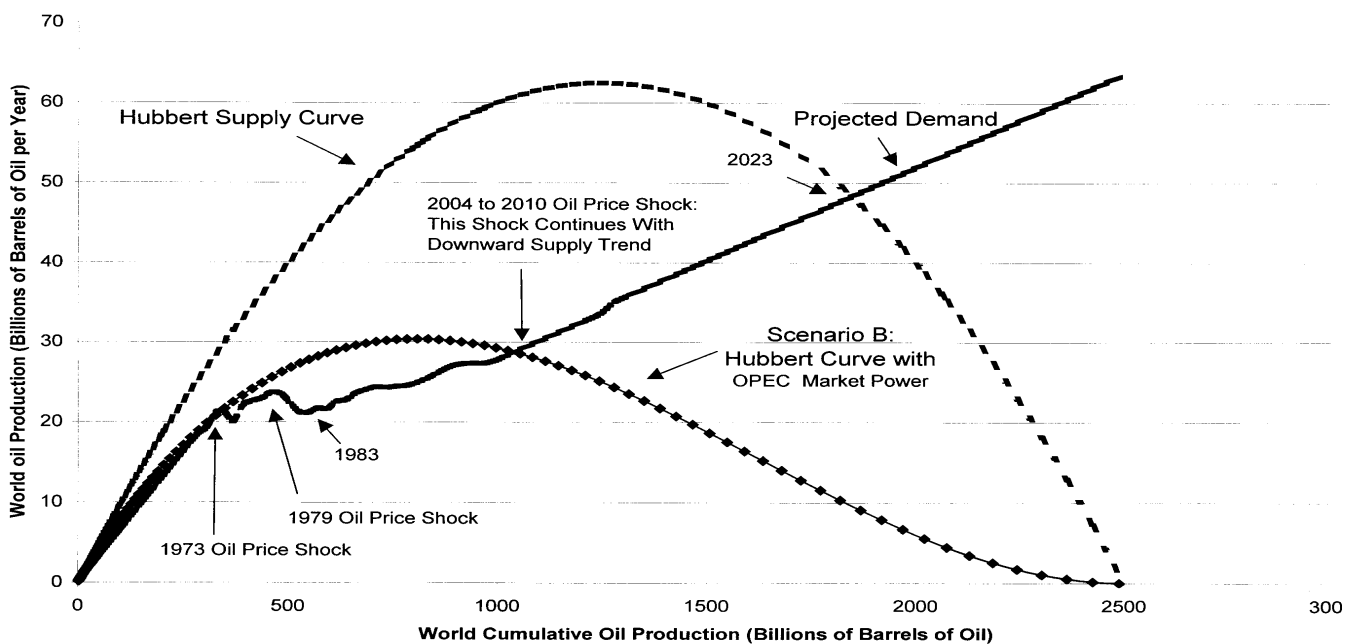
trillion barrels of world URR is actually 100% more, i.e. 4.8 trillion barrels, the price shock is only delayed another 7 years or so.

One might believe that technology will come through as the International Energy Agency believes and create oil alternatives. But we have been using oil now for over 100 years with no new technology to take the place of oil. We've seen 100 years of technological advancement and still nothing is better than oil as a transportation fuel. On the supply side, the U.S. has had 30 years of decreasing oil production even with the added super giant oil field of Prudhoe Bay in Alaska and yet technology has not been able to stop the U.S. decrease. Furthermore, the U.S. has had 40 years of decreasing oil discoveries, except when Prudhoe Bay was discovered, and still new technology has not stopped that trend. That is a long time for technology to be so ineffective. This suggests that technology will not change the oil market in the next 5 to 10 years. Therefore, we must begin preparing for the next oil shock, now. The only reason oil prices are so low right now is because demand, crippled by recessions and transitions, is far below the OPEC supply potential. However, within 10 years, world demand will be pushing against OPEC world supply potential. When that happens, oil prices will skyrocket and will never come down again. Will technology change radically enough to alter this scenario? Considering the fact that technology has not found a substitute for oil nor has substantially altered the U.S. and world Hubbert curve oil supply path for the last 100 years, ten more years probably won't make much difference.

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Hubbert, M.K. (1962). *Energy Resources*, A Report to the Committee on Natural Resources: National Academy of Sciences, National Research Council, Publication 1000-D, Washington, D.C., p. 54, 61, 67.

Figure 1
Forecast Supply and Demand for World Crude Oil As a Function of Cumulative Production



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University of Alaska Anchorage

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Chief Scientist Energy Program
US Geological Survey

United States Association for
Energy Economics
USAEE

23rd ANNUAL IAEE INTERNATIONAL CONFERENCE

Hilton Sydney Hotel, Sydney, Australia, 7-10 June 2000

Theme

*Energy Markets and the New Millennium:
Economics, Environment, Security of Supply*

The year 2000 is an ideal time to reflect on the dominant role of fossil fuels over the past century and assess how this pattern of reliance will change in the context of the liberalisation of energy markets and environmental pressures and concerns. This conference will consider: electricity market liberalisation; international experiences and expectations; the economics of renewable energy technologies; Asian energy markets and macro-financial management; liberalisation of international trade in energy resources; the geopolitics of energy supply; social, cultural, political and philosophical dimensions of energy sector restructuring; transport policy in the new millennium; and carbon sequestration and recycling.

Sydney (the Olympic City in the year 2000) has many attractions for both participants and accompanying persons, in addition to the world famous Harbour Bridge and Opera House. City and harbour tours are readily available, while longer trips into the Australian "bush" can be made with a hire car. World class vineyards are just two hours drive to the north of Sydney, sharing the area with some of Australia's largest open cast coal mines. The nation's capital, Canberra, is a 40-minute flight to the south of Sydney.

CALL FOR PAPERS

Deadline for Submission of Abstracts: 7 January 2000

Abstracts should be between 300 and 500 words, giving an overview of the topic to be covered. Full details, including the title of the paper, name of the author(s), address(es), telephone, fax and email numbers, should also be sent. At least one author from an accepted paper must pay the registration fee and attend the conference to present the paper. Anyone interested in organising a session should propose topics, objectives and possible speakers to the Programme Chairmen well in advance of the deadline for submission of abstracts. All abstracts, session proposals and related enquiries should be directed to:

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23rd Annual International Conference of the IAEE
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Sydney, NSW 2006, AUSTRALIA
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Email: R.Bartels@econ.usyd.edu.au and denzilf@econ.usyd.edu.au

Deadlines

Abstract Submission Deadline: 7 January 2000
Notification of Abstract Acceptance: 1 February 2000
Manuscript Submission Deadline: 1 March 2000

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In today's economy you need to keep up-to-date on energy policy and developments. To be ahead of the others, you need timely, relevant material on current energy thought and comment, on data, trends and key policy issues. You need a network of professional individuals that specialize in the field of energy economics so that you may have access to their valuable ideas, opinions and services. Membership in the IAEE does just this, keeps you abreast of current energy related issues and broadens your professional outlook.

The IAEE currently meets the professional needs of over 3300 energy economists in many areas: private industry, non-profit and trade organizations, consulting, government and academe. Below is a listing of the publications and services the Association offers its membership.

- **Professional Journal:** The *Energy Journal* is the Association's distinguished quarterly publication published by the Energy Economics Education Foundation, the IAEE's educational affiliate. The journal contains articles on a wide range of energy economic issues, as well as book reviews, notes and special notices to members. Topics regularly addressed include the following:

| | |
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| Alternative Transportation Fuels | Hydrocarbons Issues |
| Conservation of Energy | International Energy Issues |
| Electricity and Coal | Markets for Crude Oil |
| Energy & Economic Development | Natural Gas Topics |
| Energy Management | Nuclear Power Issues |
| Energy Policy Issues | Renewable Energy Issues |
| Environmental Issues & Concerns | Forecasting Techniques |

- **Newsletter:** The *IAEE Newsletter*, published four times a year, announces coming events, such as conferences and workshops; gives detail of IAEE international affiliate activities; and provides special reports and information on an international basis. The newsletter also contains articles on a wide range of energy economics issues, as well as notes and special notices of interest to members.
- **Directory:** The *Annual Membership Directory* lists members around the world, their affiliation, areas of specialization, address and telephone/fax numbers. A most valuable networking resource.
- **Conferences:** IAEE Conferences attract delegates who represent some of the most influential government, corporate and academic energy decision-making institutions. Conference programs address critical issues of vital concern and importance to governments and industry and provide a forum where policy issues can be presented, considered and discussed at both formal sessions and informal social functions. Major conferences held each year include the North American Conference and the International Conference. IAEE members attend a reduced rates.
- **Proceedings:** IAEE Conferences generate valuable proceedings which are available to members at reduced rates.

To join the IAEE and avail yourself of our outstanding publications and services please clip and complete the application below and send it with your check, payable to the IAEE, in U.S. dollars, drawn on a U.S. bank to: International Association for Energy Economics, 28790 Chagrin Blvd., Suite 350, Cleveland, OH 44122. Phone: 216-464-5365.

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Publications

Electric Utility Planning and Regulation, Edgard Kahn (1991). 339pp. Price \$27.00. Contact: American Council for an Energy-Efficient Economy, 1001 Connecticut Avenue, NW, Suite 801, Washington, DC 20036.

Turning Off the Heat: Why America Must Double Energy Efficiency to Save Money and Reduce Global Warming, Thomas Casten (1998). 269pp. Price \$26.95. Contact: American Council for an Energy-Efficient Economy, 1001 Connecticut Avenue, NW, Suite 801, Washington, DC 20036.

European Power Daily. Subscription. Price \$1200/year. Contact: Standard & Poor's Platt's, Wimbledon Bridge House, 1 Hartfield Road, London SW19 3RU, United Kingdom. Phone: 44-181-543-1234. Fax: 44-181-545-6269.

World Energy Outlook. 1998 Edition. Price \$120.00. Contact: IEA Publications, PO Box 2722, London W1A 5BL, United Kingdom. Phone: 44-171-896-2245. Fax: 44-171-896-2244.

China's Oil Industry and Market, H.H. Wang (1999). 428 pp. Price: \$100.00. Contact: Elsevier Science, PO Box 211, 1000 AE Amsterdam, The Netherlands. Phone: 31-20-485-2603. Fax: 31-20-485-2425.

Calendar

6-10 September 1999, Contracts in the Oil and Gas Industries: Negotiating and Drafting. University of Dundee, Scotland, UK. Contact: Mrs. Moira McKinlay, CEPMLP/University of Dundee, Dundee DD1 4HN, Scotland, UK. Phone: 44-1382-344303. Fax: 44-1382-345854. E-mail: m.r.mckinlay@dundee.ac.uk URL: www.cepmlp.org

9-10 September 1999, Oil Price Challenges into the Next Century. Houston, Texas. Contact: Samantha Holloman, Pennwell, 1700 W. Loop South, Suite 1000, Houston, TX 77027. Phone: 713-963-6251. Fax: 713-963-6212. E-mail: samantha@pennwell.com

13 September 1999, Sixth Grove Fuel Cell Symposium. London, UK. Contact: Phillipa Orme, Sixth Grove Fuel Cell Symposium Secretariat, 12 Church Street, West Hanney, Wantage, Oxon OX12 0LN, UK. Fax: 44-1235-868811. URL: www.elsevier.nl/locate/fuelcell99

13-14 September 1999, Oil and Gas in Brazil. Craine Plaza, New York. Contact: Jon Neale, Business Development, CWC Associates, Business Design Centre, 52 Upper Street, London N1 0QH. Phone: 44-171-704-6742. Fax: 44-171-704-8440.

13-17 September 1999, UK Oil and Gas Law. St Andrews, Fife, Scotland, UK. Contact: Mrs. Moira McKinlay, CEPMLP/University of Dundee, Dundee DD1 4HN, Scotland, UK. Phone: 44-1382-344303. Fax: 44-1382-345854. E-mail: m.r.mckinlay@dundee.ac.uk URL: www.cepmlp.org

15-17 September 1999, PowerTrends. Philippines. Contact: Alice Goh Project Manager, Interfama International Pte Ltd., 1 Maritime Square #09-36 World Trade Centre Singapore 099253. Phone: 65-2766933. Fax: 65-2766811. E-mail: w2608@singnet.com.sg

16-17 September 1999, World Oil Prices. Hyatt Carlton Tower, Cadogan Place, London. Contact: Jon Neale, Business Development, CWC Associates, Business Design Centre, 52 Upper

Street, London N1 0QH. Phone: 44-171-704-6742. Fax: 44-171-704-8440.

20-21 September 1999, A New Era for Energy? Price Signals, Industry Structure and Environment. St. John's College, Oxford. Contact: Mrs. Mary Scanlan, Administrative Secretary, BIEE, 37 Woodville Gardens, London W5 2LL, UK. Phone: 44-181-997-3707. Fax: 44-181-566-7674.

20-21 September 1999, Oil and Gas in Angola. One Whitehall Place, London, UK. Contact: Jon Neale, Business Development, CWC Associates, Business Design Centre, 52 Upper Street, London N1 0QH. Phone: 44-171-704-6742. Fax: 44-171-704-8440.

20-21 September 1999, Energy Utilities Advanced Valuation. NM Rothschild Ltd., London, UK. Contact: Mrs. Moira McKinlay, CEPMLP/University of Dundee, Dundee DD1 4HN, Scotland, UK. Phone: 44-1382-344303. Fax: 44-1382-345854. E-mail: m.r.mckinlay@dundee.ac.uk URL: www.cepmlp.org

21-22 September 1999, Gas and Power in India. Hyatt Carlton Tower, Cadogan Place, London, UK. Contact: Jon Neale, Business Development, CWC Associates, Business Design Centre, 52 Upper Street, London N1 0QH. Phone: 44-171-704-6742. Fax: 44-171-704-8440.

22-24 September 1999, 2nd International Energy Symposium - New Worlds. Stift Gssiach, Carinthia - Austria. Contact: Dr. A. Reuter, Verbundplan GmbH, Kohldorfer Strasse 98, A-9020 Klagenfurt, Austria. Phone: 43-1-536 05-32560. Fax: 43-463-23 97 29. E-mail: reutera@verbundplan.at

23-24 September 1999, Re-identifying and Meeting China's Oil and Gas Demand: Opportunities for Co-operation. Waldorf Hotel, London, UK. Contact: Jon Neale, Business Development, CWC Associates, Business Design Centre, 52 Upper Street, London N1 0QH. Phone: 44-171-704-6742. Fax: 44-171-704-8440.

23-24 September 1999, Co-operation for Competition: The Emerging European Regulatory System in Implementing the EU Energy Directives. Crowne Plaza Hotel, Brussels. Contact: Mrs. Moira McKinlay, CEPMLP/University of Dundee, Dundee DD1 4HN, Scotland, UK. Phone: 44-1382-344303. Fax: 44-1382-345854. E-mail: m.r.mckinlay@dundee.ac.uk URL: www.cepmlp.org

26 September - 1 October, Natural Gas: The Commercial and Political Challenges (Alphatania Training Course). Cricklade, Wiltshire, England. Contact: Esther Musoke, Course Administrator, The Alphatania Partnership, Rodwell House, 100 Middlesex Street, London E1 7HD, United Kingdom. Fax: 44-171-650-1401. E-mail: training@alphatania.com

27-28 September 1999, Corporate Transformation in the Gas Industry. Dorchester Hotel, London, UK. Contact: Jon Neale, Business Development, CWC Associates, Business Design Centre, 52 Upper Street, London N1 0QH. Phone: 44-171-704-6742. Fax: 44-171-704-8440.

27-28 September 1999, 1999 Market Forecasting Conference. Washington, DC. Contact: EPIS, Inc., 18813 Willamette Drive, West Linn, OR 97068. Phone: 503-675-0387. E-mail: ron@epis.com URL: www.epis.com

28-29 September 1999, 1999 Natural Gas Conference. Montreal, Quebec, Canada. Contact: Industrial Gas Users Association. Phone: 613-236-8021. Fax: 613-230-9531. E-mail: igua@igua.ca

4-6 October 1999, Middle East Strategy: To the Year 2012. Contact: APS House, PO Box 23896, Nicosia, Cyprus. Fax: 357-2-350265 E-mail: apsnews@spidernet.com.cy

(continued on page 20)

Calendar (continued from page 19)

13-15 October 1999, 6th Annual Indaba Africa Upstream '99. Cape Town, South Africa. Contact: Global Pacific & Partners Pty Ltd., 8 Victory Road, Greenside, 2193, Johannesburg, South Africa. Phone: 27-11-782-3189. Fax: 27-11-782-3188. E-mail: global.pacific@pixie.co.za

18 October 1999, SNS Energy Day 1999: Corporate Restructuring of the Global Energy Industry: Driving Forces and Implications. Stockholm, Sweden. Contact: Judit Weibull, Phone: 46-8-507-025-74. Fax: 46-8-507-025-45.

18-20 October 1999, Hydropower into the Next Century. Grunden, Austria. Contact: Aqua-Media International Ltd., Westmead House, 123 Westmead Road, Sutton, Surrey, SM1 4JH, United Kingdom. Phone: 44-181-643-4727. Fax: 44-181-643-8200. E-mail: conf@hydropower.cix.co.uk

19-20 October 1999, European Electricity Summit. Europa Inter-Continental, Brussels. Contact: Global Business Conferences, Sycamore House, 5 Sycamore Street, London, EC1Y 0SG. Fax: 44-171-253-2798. Phone: 44-171-608-0541.

19-20 October 1999, Managing Mergers and Acquisitions in the International Petroleum Industry. Ashurst Morris Crisp, London. Contact: Mrs. Moira McKinlay, CEPMLP/University of Dundee, Dundee DD1 4HN, Scotland, UK. Phone: 44-1382-344303. Fax: 44-1382-345854. E-mail: m.r.mckinlay@dundee.ac.uk URL: www.cepmlp.org

21-22 October 1999, Kyoto Mechanisms Business Opportunities: The Value of Projects Selection, Verification and Certification. Basle, Switzerland. Contact: Wolfram Kaegi, Institute for Economy and the Environment, University of St. Gallen, Tigerbergstrasse 2, CH - 9000 St. Gallen, Switzerland. Phone: 41-71-224-25-83. Fax: 41-71-224-27-22. E-mail: Wolfram.Kaegi@unisg.ch URL: www.iwoe.unisg.ch/kyoto

21-22 October 1999, Kyoto Mechanisms Business Opportunities: Financial Aspects. Basle, Switzerland. Contact: Josef Janssen, Institute for Economy and the Environment, University of St. Gallen, Tigerbergstrasse 2, CH - 9000 St. Gallen, Switzerland. Phone: 41-71-224-25-89. Fax: 41-71-224-27-22. E-mail: Josef.Janssen@unisg.ch URL: www.iwoe.unisg.ch/kyoto

26-28 October 1999, PowerMart '99. AstroArena, Houston, Texas. Contact: FT Energy, 13111 Northwest Fwy, Suite 520, Houston, TX 77040. Phone: 713-460-9200. Fax: 713-460-9150. URL: www.powermart.com

26-28 Interactive Energy '99. Adam's Mark Hotel, Houston, Texas. Contact: Zeus Development Corporation, 2424 Wilcrest, Suite 250, Houston, TX 77042. Phone: 713-952-9500. Fax: 713-952-9526. URL: www.interactiveenergy.com

27-30 October 1999, 2nd International Exhibition on Electric Power Equipment and Technology. Shanghai, China. Contact: Crystal Chan, Project Executive, Adsale People, Inc., 4/F Stanhope House, 734 King's Road, North Point, Hong Kong. P 408-986-8384. Fax: 408-986-1580. E-mail: adsaleusa@worldnet.att.net

7-12 November 1999, The Gas Chain: From Reservoir To Burner Tip (Alphatania Training Course). Cricklade, Wiltshire, England. Contact: Esther Musoke, Course Administrator, The Alphatania Partnership, Rodwell House, 100 Middlesex Street, London E1 7HD, United Kingdom. Fax: 44-171-650-1401. E-mail: training@alphatania.com

8-9 November 1999, North American Gas Strategies Conference. Westin Hotel, Calgary, Alberta, Canada. Contact: Ziff Energy Group. Phone: 403-234-4285. E-mail: gasconf@ziffenergy.com URL: www.ziffenergy.com/nagsconference

7-11 February 2000, CERAWeek 2000 - CERA's 19th Annual Executive Conference. Westin Galleria, Houston, Texas. For more information call Steven McCarthy at 617-441-1308 or visit www.cera.com/ceraweek

8-10 March 2000, Renewable Energy for the New Millennium Conference. Sydney, Australia. Contact: Kelvin Kent, Phone: 61-2-9241-2955. Fax: 61-2-9241-5354. E-mail: meetings@trm.com.au URL: www.esaa.com.au

11-12 April 2000, The 9th Annual Mediterranean Gas Conference. Tunis. Contact: EconoMatters Ltd., Rodwell House, 100 Middlesex Street, London E1 7HD. Phone: 44-20-7650-1430. Fax: 44-20-7650-1431. E-mail: confs@economatters.com. URL: www.gas-matters.com

9-10 May 2000, The 7th Annual Central European Gas Conference. Prague. Contact: EconoMatters Ltd., Rodwell House, 100 Middlesex Street, London E1 7HD. Phone: 44-20-7650-1430. Fax: 44-20-7650-1431. E-mail: confs@economatters.com. URL: www.gas-matters.com

7-10 June 2000, 23rd IAEE International Conference. Sydney, Australia. Contact: IAEE Headquarters, 28790 Chagrin Blvd., Ste. 350, Cleveland, OH 44122. Phone: 216-464-5365. Fax: 216-464-2737. E-Mail: iaee@iaee.org URL: www.iaee.org

23-28 July 2000, ENERGEX '2000 Conference, Las Vegas, USA. Contact: Dr. Chenn Zhou at fax: 219-989-2898, e-mail: qzhou@calumet.purdue.edu or Dr. Brian Golchert at fax: 630-252-5210. E-mail: brian_glochert@ngate.anl.gov

7-8 November 2000, 15th Annual Autumn European Gas Conference. Edinburgh. Contact: EconoMatters Ltd., Rodwell House, 100 Middlesex Street, London E1 7HD. Phone: 44-20-7650-1430. Fax: 44-20-7650-1431. E-mail: confs@economatters.com. URL: www.gas-matters.com

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