Miscellany 39: Whom Will the US Invade Next over Oil?

Commentary on recent news, reading and events of personal interest.

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Whom Will the US Invade Next over Oil?

Some Background Comments on Mathematical Models of Economics and War

I have spent my professional career in research, research management, consulting and teaching. For a good portion of my career I was engaged in the field of operations research, which is the application of the modern methods of statistics and optimization theory to solve practical problems in various applications areas, such as defense, industry, business, and banking. For example, in defense applications I developed mathematical models to determine optimal strategies for allocating offensive and defensive missiles to targets, and in banking operations I developed optimal strategies for determining prices of loan products ("variable-rate pricing strategies"). In high-value applications involving national security or large amounts of money, no expense is spared in finding very good solutions to these problems, and the analytical methodologies involved are often quite complex.

Applications involving the determination of optimal strategies involve techniques from statistical decision theory, game theory, and optimization theory. One of the methodologies that is very useful for solving problems involving the optimal allocation of resources (missiles, capital, or whatever) is the method of Generalized Lagrange Multipliers (GLM), developed by Hugh Everett III. I worked with Hugh Everett for five years, while a member of the staff of his firm, Lambda Corporation. Everett is famous for two very important contributions to science. First, he conceived the notion of parallel universes to explain the behavior of subatomic particles. This theory is famous not only in physics, but also in "New Age" circles. His second major contribution was the GLM methodology. It is a powerful optimization methodology that can be used to solve difficult constrained optimization problems (that, in mathematical terminology, involve objective functions (payoff functions) that are nonlinear, discontinuous and nonconvex).

Everett's technique is most appropriate when the payoff function (the function to be maximized) may be represented as a sum, such as the sum of damages to a large number of military targets, or the profits from a large number of customers. Examples of applications of Everett's approach are shown at http://www.foundationwebsite.org/LagrangianApproachToCRM.htm (an example in the field of banking) and http://www.foundationwebsite.org/OptStratNoDefense.htm (an example from the field of ballistic missile warfare). The technique may be used to solve constrained optimization problems that are "one-sided" (e.g., a resource-constrained maximization problem, in which there is no opponent) or "two-sided" (e.g., a resource-constrained game, e.g., as in http://www.foundationwebsite.org/SubtractiveOverlappingIslandDefense.htm).

Lagrangian optimization involves the use of mathematical constructs (variables) called *lagrange multipliers*. In the mathematical model, there is a lagrange multiplier associated with each constraint in the problem. The lagrange multipliers have a very useful interpretation. At the optimal solution, each lagrange multiplier indicates the marginal change in the payoff function per unit change in the corresponding constraint. In economic applications, the lagrange multipliers are called *shadow prices* or *shadow values*. Knowing the values of the shadow prices is important for the economic planner, because they indicate which constraints are having the most important impact on the payoff. In a major economic development problem, the planners will develop an economic cost-benefit model that enables them to determine these shadow prices. (For more information on shadow prices, see the Wikipedia entry for that term, http://en.wikipedia.org/wiki/Shadow_price .)

In my work in strategic planning, I have often used statistical decision theory, game theory and the method of Generalized Lagrange Multipliers to determine optimal strategies. In my book, *Can America Survive?*, I used the decision criterion of "minimal regret" to determine an optimal population for planet Earth. In that book, I also examined a number of different strategies for waging global war involving the placing of nuclear bombs on cities. The objective of that analysis was to estimate what level of damage could be caused by "suitcase" bomb attacks from terrorists. The various "attacks" that I examined in this analysis were determined using the GLM method. (Although the attacks presented in *Can America Survive?* were determined with the primary objective of estimating the damage caused by terrorist attacks, they are of interest to any power that is interested in reducing the human threat to the biosphere, because of the objective functions used – population, energy, biodiversity, and a "combination." They would address directly, for example, the issue of global warming – any one of them would be a good candidate to win Richard Branson's Greenhouse-Gas Removal Prize (announced just yesterday, 9 February 2007).)

The method of Generalized Lagrange Multipliers and the other methodologies used to solve economic models and war games (e.g., the Nash bargaining solution to a general-sum game) are complicated and complex, and difficult for lay readers to appreciate. It occurred to me, therefore, that it would be useful to write a brief note, with limited mathematics, showing the likely course of events over the next few years with respect to global war, and, more specifically, to speculate on which country the US would invade next over the issue of oil. The following paragraphs avoid the use of advanced concepts, such as game theory, lagrangian optimization, and statistical decision rules, and instead use simple, intuitive concepts to identify a reasonable strategy for using the remaining global oil supply. This example is a very simplified example of the type of thinking that goes into the development of an optimal strategy, and a forecast of future events. In a real application, many more factors would be taken into account and quantified. I have spent perhaps ten minutes dreaming up this brief example; in a real-world setting, many person-years would go into the formulation and solution of the problem.

The reader who is unfamiliar with military systems analysis may find it rather surprising that real-world wars are in fact fought using “ivory-tower” strategies determined from mathematical theories such as statistical decision analysis, game theory, and lagrangian optimization. In fact, realistic models of conflict invariably involve the use of “randomized” strategies, in which the players decide on their particular actions based on the selection of random numbers (they do this not just to keep the other player “guessing,” but because it enables them to achieve a better payoff (a “min-max,” or “saddle-point,” solution, in which neither player can do better)). It may seem very wrong that a person’s or a city’s or a country’s fate could be determined by such a seemingly inconsequential thing as the toss of a die (i.e., a computer-generated random number in a randomized strategy). But it is very much so. I worked for many years in defense contracting, and have seen the use of these models over and over again to develop military strategies, tactics and war plans. The major weapon technologies of today – electronics, atomic bombs, missiles – were developed by mathematicians and physicists, and the strategies for their use are decided by these same people. I know how these people think because, at one point in my career, I was one of them.

The key aspect of economic and war models is that they are *optimization* models. In a “one-sided” optimization problem, the goal is to allocate resources so as to maximize (or minimize) a payoff function (objective function). In a “two-sided” optimization problem, one player is attempting to minimize a function while the other is attempting to maximize it (e.g., a zero-sum, or “min-max,” game), or the two players may be attempting to extremize two different payoff functions (e.g., a bimatrix game or a general-sum (nonzero-sum) game). The essential thing is that the mathematical model recognize the essential features of the situation, viz., that each player in the game is seeking to maximize or minimize some quantity (which may difer for the various players), subject to constraints on resources available to his disposal (e.g., capital, weapons). In the case of geopolitics, the US is attempting to maximize the material wealth of the wealthy elite who control it. *In order to predict the future course of world events, it is essential to understand who is in control, and what their goals and objectives are.*

From the point of view of the US, it would appear that the maximization of the wealth of the US wealthy elite is a primary goal for the US. Accepting this as the goal means that whenever the US has a choice of alternative actions (or policies or strategies) in international affairs, it chooses that one that is expected to increase its wealth the most. This is a bit of a simplification, since (as is known from the fundamental theorem of finance) there is always a tradeoff between expected return and risk. Depending on one’s value (utility) system, he may select an alternative that has a lower expected return, if the risk associated with that alternative is substantially less (or the reverse may be true – a person may choose to routinely participate in a lottery in which he almost always expects to lose, and for which his expected winnings are negative, in exchange for the rare chance that he might win a million dollars). The US may decide, for example, that it is preferable to opt for a single global economic system rather than “going it alone,” even though the latter might have allowed greater wealth for the US, if the former is a much less risky path to substantial, although not as great, wealth.

In order to develop strategies that assist the maximization of wealth, it is necessary to develop detailed mathematical models that estimate the change in wealth associated with various actions. Examples of such models are models of the economy and war-game models. This brief note will not develop or describe any complex models; it will instead illustrate basic concepts of strategic analysis, using intuitively simple examples (a few tables and graphs and some discussion).

Although maximization of wealth may be the goal of the US wealthy elite, they are not the sole players in the game on planet Earth. In previous times, the countries, regions and empires of the world operated in a much more independent fashion than they do today – this was very natural, in view of the limitations in communication and transportation. Wealth was generally measured in terms of territory and natural resources, and wars were fought over possession of these assets. Today, much wealth is generated by automated means using energy and technology, and is distributed by capitalist market economics (massive international free trade), and territorial resource wars are not as common as they used to be. National boundaries are becoming transparent to economic activity. This change may be a natural evolution of technology, but it is also a conscious design – e.g., the foundation of the New World Order (United Nations, Breton Woods, etc.) after the very destructive Second World War. The world now seems to be very much in thrall to the "Illuminati" who control the global economic system. The ultimate goal of the New World Order is the system of global economics / industrialization / commerce, with all countries profoundly intertwined. At that point, income and wealth are so dependent on the interrelated system that no region or country – or individual – can operate independently. The entire world will at that point be in a stranglehold of the economic system.

As the world reached the point at which single nations could destroy the entire economic system, the nature of the global system changed. No longer was it reasonable for single nations to adopt a world view in which it was they against the rest of the world, because, with nuclear weapons in the hands of several nations, this view may easily lead to global destruction. The view of the world as an "n-person game" was viable only as long as no single nation could destroy it. In the nuclear age, a new world view was necessary for survival. That view is the unitary global economic system that we see evolving today.

The transition to the new system is not yet complete. While the extent and degree of economic integration has advanced tremendously, it is still quite possible for countries to operate semi-autonomously. There still remain vestiges of the previous system, when empires and countries could be self-sufficient. At times it seems as if major powers such as the US, Russian and China can operate unilaterally, as if they were playing a "zero-sum" game with the rest of the world. This is, however, more apparent than real.

In what follows, I shall consider two different world paradigms. In Paradigm 1, the US is assumed to be a power unto itself. In this paradigm, it is assumed that there is no Illuminati (or Great White Brotherhood or New World Order or Global Synarchism or Global Synarchy or Agharta/Shambhala, or whatever it may be called) controlling the planet. Under this paradigm, the US (as the world's sole superpower) can make decisions in its own interest, ignoring the rest of the world. Since the US is currently the world's sole superpower, it may appear that this view is reasonable. Under this paradigm, it may be assumed that the goal of the US is increased wealth for the US wealthy elite.

In Paradigm 2, the world is assumed to be under the control of a single power, or force, or interest, or religion / philosophy. It is the power that is guiding / directing the planet toward a single global economic system. In Paradigm 2 the world controlled by economics, not by the US. Under this paradigm, it may be assumed that the goal of this power is maximization of global wealth. In this view, the US is simply one of the global players, but it is as much under the control of the global economic system as any other nation – it simply happens to be the largest economy, but it is not in global control.

Note that these two paradigms are not in opposition; they are just different. It is quite possible that the goal of Paradigm 1 – maximization of US wealth – is best achieved (e.g., more likely to

be achieved) by adopting Paradigm 2 – maximization of global wealth. I will leave it to the reader to decide whether the US has adopted a policy of massive international free trade because this policy has the best chance of maximizing US wealth (or, as it altruistically claims, for maximizing global wealth), or whether it has adopted this policy because it is under the control of a global Illuminati.

The important thing to realize is that the formulation of the situation (e.g., one-sided optimization problem, two-sided optimization problem, zero-sum game, nonzero sum game, utility function, etc.), especially the choice of the objective function, can have a profound effect in determining what the solution strategies are. At first glance, it would appear that the current world situation (massive international free trade) appears to make more sense under Paradigm 2 (a single global world order) than under Paradigm 1 (a US in control of its own destiny, apart from (or seemingly apart from) the rest of the world). Which paradigm applies will become clearer at the point at which global oil reserves decline to the point where there is insufficient oil for all developed countries (about two-thirds of current global production). At that time, the US will either move to channel the oil to itself (Paradigm 1) or continue to let the oil flow to the highest bidder (Paradigm 2). This article is concerned solely with the near term, and the results in the near term are about the same under either paradigm.

The US currently consumes about a quarter of the world oil production. All oil will be gone by 2050. Under Paradigm 1, the US will make sure that it has access to oil (or, more correctly, the wealth and power enabled by oil) until the end. Under Paradigm 2, the oil will go to the wealthier nations until the end (since they have the most power / economic control, not because they make the most productive use of energy). Under either paradigm, for the time being (before the "end time," when oil runs out), under the system of global economics the oil goes to the highest bidder – to those willing and able to make the most productive economic use of it. Hence, to address the question raised in the title of this piece – whom will the US invade next – the answer will be the same under either paradigm, since, in the near term, both paradigms involve the same *modus operandi* – the oil goes to the highest bidder, and we are at present far from the end game in which oil runs out and is unavailable at any price (or the mid-game when the world production supply cannot support even the US, and one must choose between the Paradigm 1 objective of maximizing US wealth or the Paradigm 2 objective of maximizing global wealth).

In addition to understanding what the goal of the US is, it is important to understand the goals, capabilities and limitations of the other players (under either paradigm). In the simple example presented here, I shall represent the problem as a one-sided optimization problem, in which the US is making all of the decisions. This representation is reasonable as an initial approximation, so long as it is only the actions of the US that matter. A real-world application would reflect the fact that relationships among countries may involve actions by several important players – at least two (and usually just two) – and would be formulated as a mathematical game (e.g., a two-player zero-sum game ("min-max" problem) or a two-player nonzero-sum game or a multiplayer ("n-person") game). At the point at which the actions of other players (e.g., Russia, China, terrorists, allies) become important, it is important to represent that aspect in the model, i.e., to represent the situation as a two-sided optimization problem, or mathematical game (a nonzero-sum (general-sum) game, since the objectives of the players (especially under Paradigm 2) are not diametrically opposed (zero-sum, in which one player's gain is the other player's loss). In the real world, the economic models and war-gaming models used to support diplomatic, economic, and military actions are very elaborate, and take into account all important aspects of the situation.

Despite its simplicity, the example presented here does illustrate basic concepts in strategic planning, and it does indicate the gist of future global political events. It suggests how various categories of countries of the world will be affected in the future, as global oil supplies decline. In a real application, the mathematical representation would be refined to the point where a highly detailed strategy would be developed, providing detailed estimates of the payoff corresponding to various actions and providing prescriptions for determining particular actions against particular countries under specified conditions.

The Role of Oil in Politics

Oil is essential to modern industrial society. About half of all of the world's oil has been used up, and, at current rates of consumption, all of it will be gone by 2050. A curve showing the rise and fall of oil production (in a large region, such as the US or the world) is called Hubbert's Curve. We are now at the point of peak (maximum) production. This point is called Hubbert's Peak. From now on, global oil production will start to decline. As it does, human population, which has reached 6.5 billion primarily because of oil (mechanized agriculture, fertilizer, irrigation, herbicides, pesticides, improved varieties), will start to decline, too. This population decline will be a massive "die-off." But it will not be the case that people simply sit around and quietly starve to death – their leaders will never permit this! Instead, wars will be increasingly fought over the declining oil supply. These resource wars will involve millions of casualties. Between now and 2050, about 140 – 220 million people will die, on average, each year, and most of those deaths will be from war, not from famine or disease.

Most of the wars of the twentieth century, and certainly all of the major ones, were fought over the issue of oil. The twenty-first century will be no different. In recent years, there have been two major wars fought over oil – the first and second Iraq wars (the Gulf War (1991) and the current War in Iraq). It is interesting to speculate where the next wars over oil will be. It is not possible to predict the exact time and location of each future war, but it is certainly possible to predict which types of countries will be the next targets because of oil.

Wars are fought over oil because it is an incredibly inexpensive source of high-grade energy (costing as little as ten cents a barrel in the 1930s), but it is located in very few places. As global oil supplies decline, wars over oil will be more common, more frequent, and far more destructive, than in the past.

The US is now the world's sole superpower, and its population, although just five percent of the world's total, consumes about 25 percent of the global oil supply. The US appetite for oil is voracious. Americans use ten to one-hundred times as much commercial energy per peson as people in most countries, and much of that energy comes from burning oil. By 1970, the US had used up half of its own oil, and it now depends mainly on foreign sources for its oil. Most of the world's oil reserves are located in less-developed countries.

For the second half of the twentieth century, the strategy of the US with respect to obtaining oil was very simple. It is described in John Perkins' book, *Confessions of an Economic Hit Man* (Plume, 2004). First, the US purchases the oil from a less-developed country. In exchange for military protection and large payments to a small number of the country's wealthy elite, the US agrees to purchase the oil with the understanding that the country will then give back most of the payment for the oil (the "petrodollars") in exchange for funding of massive infrastructure development projects. The leaders of the less-developed country agree to this scheme

because they become fabulously wealthy – it does not cost much to give large payments to the few wealthy elite who control the country. The US gets almost all of the oil-payment money back, in the form of contracts to US contractors and economic consultants. In effect, it gets all of the oil (and other natural resources) from developing countries almost for free – it is almost all used for payments to US contractors and consultants. Although a few leaders of the less-developed country become very wealthy, the citizens of the less-developed country get nothing but a ruined country in return. At the end of the process, they have no oil or other natural resources. They are given just enough food and medicine so that their population explodes, and little else. In a few decades, when the oil is gone, they have nothing to show for it but massive office buildings, roads, bridges and dams. Their forests are gone, their wildlife is gone, their rivers and lakes are ruined, and their land is destroyed. Their population has exploded, and the land can no longer support them. They are far worse off than before.

The preceding approach is used to obtain oil from less-developed countries having oil (essentially for free!). For all other countries, under the system of massive international free trade (whether a US policy or and Illuminati policy), the oil goes to the highest bidder – to countries willing and able to pay the price in the world market. So why and when will wars erupt over oil? In the near term, there will be plenty of oil available to countries having high per capita incomes. Those countries that cannot afford oil will be shut out of the global oil market, endure stress, and be forced to a low standard of living, or starvation, or war. There will be much war as soon as Peak Oil passes and the global human population starts to decline. These wars, along with famine, will cause the deaths of about 200 million people per year, on average, between the point at which global oil production starts to noticeably decline (soon) and when it essentially runs out (about 2050).

A Simple Model for Predicting the Global Course of Events over Oil

With this understanding of how the process works, it is now possible to construct a scenario of how the future will unfold. First, let us divide all of the countries of the world into several categories, depending on their cultural affinity to the US, their oil reserves, their oil production, their oil consumption, and their military power, or threat. Per capita income is an important factor, but it will be addressed later. There are other factors that would also be of importance in a thorough analysis, such as the magnitude of their total fossil-fuel reserves (e.g., coal), and strategic considerations such as whether an oil pipeline passes through their territory, but I am trying to keep this example simple.

The only energy of interest here is fossil-fuel energy. Solar energy (including solar-derived sources such as hydroelectric and wind) accounts for very little of the world's total energy supply. It does not matter how much uranium-ore reserves a less-developed country has, because the US will never allow nuclear power plants in less-developed countries. The reason for this is a little complicated. There are two ways to "burn" uranium fuel: (1) in a once-through reactor; and (2) in a "fast-breeder" reactor. Using a once-through reactor, all of the world's uranium is used up in about 50 years; using a fast-breeder reactor, the world has a 300,000-year supply of energy. The problem with fast-breeder reactors, however, is that they produce plutonium, and a golf-ball sized lump of plutonium is sufficient to build an atomic bomb. Each nuclear reactor used to produce electricity is, in fact, a plutonium-producing plant. Because of the world's political instability, the US will not allow these plants to be scattered around the world in less-developed countries.

Under the current global system of economics, as global oil production starts to fall, the price of oil will rise, and oil will stop flowing to the poorer countries. This process will continue for some time, since all of the poorer nations combined currently consume only about one-third of the world's oil production (this may be seen from Table 5 presented later in this article). Soon, no matter how high the price rises, there is simply not enough oil for all the developed countries to continue their oil-based economies (despite a half-century search, no energy substitute has been found that has the energy concentration, convenience and abundance of oil). At that time, the wealthy nations will commence to wage war on each other, since this is the only practical way to reduce demand (without reducing the standard of living, such as giving up private automobiles or consuming food at a lower trophic level). Conversion of coal to oil and production of ethanol from plants will ameliorate the situation slightly, but not much (the former process is very energy-inefficient and the latter, if done on a large scale, would greatly reduce the global food supply).

The resource wars of the future will be fought over oil, and the nature of the conflict will depend on the factors listed above (as well as others). Here follows a list of the world's countries classified according to several of the categories defined above, and a few comments about each category. (I am writing this in a hurry, so I am categorizing countries just approximately and intuitively, and I may misclassify some countries. The gist of the argument is unaffected. I am not using all of the factors listed above. For example, I am using oil reserves but not oil production, since they are positively correlated. The purpose of the classification is to simplify the problem, and that may be accomplished without explicitly considering every factor.)

Category 1: Countries having a strong cultural affinity with the US. We will not attack these countries, even though we may be competing with them for oil.

Countries in Category 1: Canada, United Kingdom, Australia, New Zealand.

These preceding countries will be excluded from further consideration. The remaining factors are size of oil reserves, size of oil consumption, and military power / threat. Countries having substantial reserves are inviting targets for conquest, to assure access to the remaining oil supply. Countries having high oil consumption are competitors for the dwindling supply, and are inviting targets for destruction, to reduce demand. The military power of a country must be taken into account when deciding how to compete with it for oil.

If we rate each country as "high" or "low" on each of the three factors mentioned, then there are a total of eight different categories defined by the factors. The remaining countries of the world may be sorted into these eight categories.

Category 2: Countries possessing substantial oil reserves; high oil consumption; military power (threat). These countries are a source of oil and they are competitors with us for oil. They are, however, military powers, and will not be bothered initially.

Countries in Category 2: Russia.

Category 3: Countries possessing substantial oil reserves; high oil consumption; not a military threat. These countries are a source of oil and they are competitors with us for oil. As the price of oil increases, these countries can afford to pay for it (since their income from oil rises correspondingly). As long as they are willing and able to sell the oil to the world, they have little to fear. If, because of exploding population, they ever reach the point where they are

consuming all of their oil and producing no wealth for the West, their populations or economies will be destroyed to free the oil for more productive use by the world's wealthier countries

Countries in Category 3: Saudi Arabia, Iran, Mexico, Venezuela, Nigeria, Iraq, Brazil, Kazakhstan.

Category 4: Countries possessing substantial oil reserves; low oil consumption; military threat. These countries are a source of oil, but they do not use much themselves. There are no countries in this category.

Countries in Category 4: None.

Category 5: Countries possessing substantial oil reserves; low oil consumption; not a military threat.

Countries in Category 5: United Arab Emirates, Kuwait, Libya, Qatar, Algeria. Same note applies as for Category 3 countries.

Category 6: Countries possessing little or no oil (i.e., with little or no oil reserves); high oil consumption; military threat. These countries compete for the global oil supply, but are a military threat. In the short term, since they are a military threat, they will not be invaded or attacked over oil.

Countries in Category 6: China, India

Category 7: Countries possessing little or no oil, high oil consumption; not a military threat. These countries can afford to pay for oil in the world market. They generate much wealth from oil, and will not be attacked over it (until it finally runs out, there is insufficient oil reserves to fuel these countries (at any price), and the only way to obtain oil is to destroy other countries that are competing for it).

Countries in Category 7: Japan, Netherlands, France, Republic of Korea, Italy, Germany, Spain, Belgium, Turkey.

Category 8: Countries possessing little or no oil, low oil consumption; military threat. There are no countries in this category (if there were, these countries are not competitors for oil, and would therefore be left alone).

Countries in Category 8: None.

Category 9: Countries possessing little or no oil; low oil use; not a military threat.

Countries in Category 9: All remaining countries (not listed above). These countries are essentially irrelevant to the analysis. They possess little or no oil, they use little oil, and they are not a military threat. They will not be attacked over oil. As long as they can afford to pay for it, they will have it. If they cannot, they will decrease their standard of living, wage war with each other, or starve.

The preceding categorization has simplified the problem considerably. In this simplified problem formulation, most countries (in Category 9) are not significant to the analysis. I shall now turn

attention to the ones that remain (in Categories 2-8). First, I present some general observations, and then examine these oil-significant countries in greater detail.

Some General Observations

As the world's oil supply declines, the US will not simply brazenly attack a country "out of the blue." Over the past half-century, the US has promoted a system of global industrialization based on massive international free trade. Oil and other valuable resources are now exploited and delivered to wealthy countries based on the system of capitalist economics. They are not simply expropriated by physically taking over a country, as in colonial times. In today's neocolonial world, they are exploited by taking over a country economically. They are controlled in accordance with Machiavelli's dictum to place a local "prince" (local puppet government, local wealthy elite) in charge (one of the three ways of administering a conquered country).

As noted earlier, most of the world's resources are in less-developed countries (since the developed ones have been exploiting theirs for a long time). The usual method for obtaining resources from a less-developed country is the method described by John Perkins. The US deals with a corrupt dictator of a less-developed country, or with its wealthy elite, to obtain permission to extract all of the country's resources in exchange for payments to the dictator or the wealthy elite. These payments may be outright bribes, or they may be "business" contracts.

In a few cases, such as in Iraq, the dictator may not cooperate. In such cases, the US asserts that the country's people want to be free, and it then invades, ostensibly to spread "freedom and democracy." The country is destroyed, and it is then expected to pay for its reconstruction with its oil (or other natural resources) – its newly installed leaders agree to this. This is essentially the same procedure as described by Perkins, except that the country did not agree to follow that procedure initially and had to be forced to do it.

The US maintains that it is acting in a morally proper manner. It claims that it is simply following good procedures of economics (promoting free trade, encouraging "structural adjustments," accomplishing goals and objectives to promote economic development and reduce poverty), or is freeing people from cruel dictators, or is spreading freedom and democracy and promoting self-determination of peoples. And this assertion is correct. Unfortunately, economics is in fact an evil system that destroys planets and causes massive human misery. It is "sold," however, as a system that improves people's lives and reduces poverty. Mathematician John Maynard Keynes observed the fatal limitations of economics as a long-term basis for human society (in his 1930 essay, "Economic Possibilities for our Grandchildren"):

> "Some day we may return to some of the most sure and certain principles of religion and traditional virtue – that avarice is a vice, that the extraction of usury is a misdemeanor, and the love of money is detestable. But beware! The time for all this is not yet. For at least another hundred years we must pretend to ourselves and to every one that fair is foul and foul is fair; for foul is useful and fair is not. Avarice and usury and precaution must be our gods for a little while longer."

In the real world, the US develops sophisticated economic and war-gaming models that are quite complex and contain many variables, before it takes action. Also, the strategies employed are often "contingency plans," that are triggered by a fortuitous (chance) event. The simplified example being presented here will not specify which country will be invaded next with a high

degree of certainty – that occurrence will likely be determined "opportunistically," by the occurrence of a chance event such as the assassination of Archduke Franz Ferdinand of Austria (which precipitated World War I) or Saddam Hussein's invasion of Kuwait (which precipitated the First Gulf War). Nevertheless, it is still possible to predict the types of countries that will be attacked, conquered or destroyed because of oil, with a little further reasoning.

Barring an unusual and unforeseen event, the US will not deliberately attack (over oil) any country that can retaliate in force, while it still has the option of coercing many other defenseless countries to do its will and there is still sufficient oil for the economically developed (rich) countries of the world. Hence, countries such as Russia and China, which are capable of destroying the US with nuclear weapons, will be the last countries attacked over oil, unless unforeseen developments occur that precipitate a war beforehand. Also, the experiences in Vietnam and Iraq have forcefully reminded the US that it is in no position to fight a land war with human troops. Instead, it must generally rely on its arsenal of high-tech weapons that are operated from a distance, such as nuclear bombs, cruise missiles, and aircraft, to wage war. If a country possesses oil and becomes problematic (e.g., Iraq under Saddam Hussein), the US will engage it in warfare. If it has no oil, e.g., Somalia, it will be ignored.

If the goal is to destroy a country totally, then any of these weapons may be used. As global oil supplies decline, the need for the industrial infrastructure that the industrial world has developed with oil and to use oil also correspondingly declines. Hence, if a country's population is attacked, it does not matter whether its industrial infrastructure is destroyed also – except for its oil infrastructure, if it is an oil-producing state. In attacking countries that have oil, however, it is desired to keep the oil extraction infrastructure intact, so the US may resort to biological and chemical warfare in order to annihilate the population and leave the oil infrastructure intact.

The really interesting aspect of the development of a global economic system for exploiting and distributing oil (and other commodities) is that the US normally does not *need* to invade a country, take it over, and physically control the production of oil and delivery of it to the US. Instead, the economic system does this, all automatically. Economics is the great controller (and executioner) of human society. All the US has to do is to ensure that the global economic system (the New World Order, global synarchism) continues to function. This is easy to do, because economics has an irresistible appeal to greed – it promises a better life and the opportunity to accumulate wealth to everyone. The US has in fact been doing this very well in the past, and it will continue to do so (ostensibly working through international organizations such as the World Bank and the United Nations). It will, in the future, generally perform a policing function to maintain the global economic system; it will not operate as a central authority to decide who gets the diminishing oil supply (the world market will do that).

As noted, very soon there will be a decline in global oil production. It is not possible to increase the global oil supply (conversion of coal or shale oil to oil is not efficient; production of ethanol from plants reduces the global food supply and accelerates starvation of the world's poor). The US and the rest of the West do not mind if the supply is "tight," because then the price of everything goes up, poor and middle-class people work harder and become more desperate, and the wealthy become much wealthier. The global economic empire generates more wealth when oil sells for USD70 a barrel than when it sells for ten cents a barrel (as in the 1930s).

There may be a limit to raising the price, however, and the economic powers may not allow the price of oil to rise beyond the point at which oil, on which the global economy crucially depends, is so expensive that it retards economic growth. At that point, other means, such as rationing, embargoes, or war may be used to balance demand and supply. No matter how expensive oil

becomes, however, it is unlikely to threaten global economic collapse, so the likelihood of this is low. As the price goes higher, less-productive countries will simply drop out of the economic picture. Because of the intertwined global economy, supply and demand will usually balance without the need for war, as long as there remains sufficient oil for the West. The leaders of those countries who lose access to oil will be encouraged (by money, as usual) to motivate their populations to simply accept "the price" as something beyond their control, and to accept that they have no "basic human right" to the planet's resources, if those resources happen to be located in some other country.

As countries lose access to oil because of high price, the politics of envy will take over and some may strike back at the developed world as best they can, by terrorism ("asymmetric" warfare). If the world returns to a "bipolar" state (e.g., US vs Soviet Union in the Cold War), then the two sides will compete for oil militarily. When the point is reached (after Peak Oil) where supply cannot be increased and the demand continues to rise (because of growing world population and the desire of countries such as China and India to improve their standards of livings), the US (and the West) will match demand to supply in most cases (in view of their commitment to global capitalist economics) simply by raising the price. If some countries object, rationing or embargoes may be applied. For the countries that no longer have access to oil, the alternative is submission and starvation (or other means of population reduction), or resistance and war. Because no political leader is willing to reduce his population or to reduce their standard of living, however, the only practical ways to reduce demand is for the US to destroy the country's population or destroy its economy. This can be done directly, via military warfare, or indirectly, via destruction of its economy and starvation.

Raising the price of oil will be the strategy used initially to deal with declining production (i.e., to balance supply and demand). Eventually, however, no matter how high the price is raised, there will simply not be sufficient oil for all of the developed world. For a while, alternative means may be used to replace oil, such as conversion from coal and oil shale / sands, and production of ethanol from plants (biogas, biodiesel). Production of ethanol from plants will accelerate famine, since it uses agricultural capacity that would otherwise be used to produce food to feed people.

A Look at Country-Specific Data

The categorization of countries that was presented above showed which countries of the world were most significant with respect to oil. In order to determine an answer to the question posed in the title to this piece ("Whom Will the US Invade Next?"), however, it is necessary to examine the countries in more specific detail. This section will do so, using readily available data from public data sources.

The following factors are important in determining how a country will be affected by a decline in global oil supply: economic development, energy efficiency, oil consumption, oil production, and oil reserves. To reflect these factors, the following variables were identified in the World Bank *World Development Indicators 2005* CD and the Central Intelligence (CIA) *The World Factbook 2007*, located at Internet website https://www.cia.gov/cia/publications/factbook/index.html .

From the WDI CD:

Gross Domestic Product: GDP (Constant 2000 US$): GDP (2002 data)

GDP per unit of energy use (2000 US$ per kg of oil equivalent): GDPperKGOE (2002 data)
GDP per capita (constant 2000 US$): PCI_WB (2002 data)

From the CIA database:

GDP - per capita: PCI_CIA
Oil – consumption: OilCons (barrels per day) (mostly 2004 data, various public sources)
Oil – production: OilProd (barrels per day) (mostly 2005 data, various public sources)
Oil – proved reserves: OilRes (barrels) (mostly 2006 data, various public sources)

The GDP per capita is a measure of per capita income (PCI) based on a country's gross domestic product: it is simply the GDP divided by the population. It is generally used in economic analysis involving the world's countries because data on per capita income based on a country's total personal income (which is generally lower than GDP) are generally not available.

The per capita income is used from both sources (World Bank and CIA) since the CIA figures are a little more recent and available for more countries, although the World Bank figures are more widely used (cited).

What is desired is to identify the countries of the world that are most significant with respect to oil. This will be done by ranking the countries with respect to each of the indicators listed above, and taking the top 20 from each list. The set of "oil-significant" countries will be those that appear on any of these seven "top-twenty" lists. There are a total of 51 such countries. The rankings of the countries are shown on the following seven tables. These oil-significant countries will be referred to as "Major Countries" in the tables and graphs to be presented below. (The data were assembled into a Microsoft Access database named OilStats.mdb . That file is contained on the Fourndation website. The table containing data for all 209 countries of the world is named OilStats, and the table containing data for the 51 oil-significant countries is named OilStatsMajorCountries.)

Table 1. Major Countries Ranked by GDP

Code	Country	GDP	GDPind
USA	United States	10,032,000,000,000	1
JPN	Japan	4,749,812,057,662	1
DEU	Germany	1,889,460,567,533	1
GBR	United Kingdom	1,494,126,191,557	1
FRA	France	1,351,649,161,599	1
CHN	China	1,258,226,147,850	1
ITA	Italy	1,097,658,559,057	1
CAN	Canada	751,126,927,480	1
BRA	Brazil	621,136,092,445	1
ESP	Spain	589,531,416,989	1
MEX	Mexico	584,854,870,901	1
KOR	Korea, Rep.	568,621,216,645	1
IND	India	500,616,000,001	1
AUS	Australia	415,402,887,291	1
NLD	Netherlands	376,054,818,500	1

RUS	Russian Federation	285,694,987,558	1
CHE	Switzerland	249,171,068,214	1
SWE	Sweden	246,855,776,997	1
ARG	Argentina	242,076,207,253	1
BEL	Belgium	231,353,418,095	1
AUT	Austria	194,459,277,686	0
SAU	Saudi Arabia	189,969,398,736	0
NOR	Norway	183,909,266,335	0
HKG	Hong Kong, China	169,261,562,950	0
DNK	Denmark	162,324,578,441	0
IDN	Indonesia	161,111,330,459	0
THA	Thailand	132,073,554,723	0
FIN	Finland	123,937,718,813	0
ISR	Israel	114,214,861,363	0
VEN	Venezuela, RB	113,574,087,426	0
IRL	Ireland	107,580,062,650	0
IRN	Iran, Islamic Rep.	106,820,200,706	0
SGP	Singapore	92,243,031,451	0
ARE	United Arab Emirates	74,019,479,918	0
DZA	Algeria	57,093,137,364	0
PER	Peru	55,746,502,989	0
NGA	Nigeria	44,054,424,364	0
KWT	Kuwait	36,497,367,699	0
KAZ	Kazakhstan	22,796,027,469	0
LUX	Luxembourg	20,208,033,905	0
URY	Uruguay	17,264,809,192	0
CRI	Costa Rica	16,583,420,804	0
AGO	Angola	10,536,674,731	0
ISL	Iceland	8,599,033,276	0
GNQ	Equatorial Guinea	1,600,292,372	0
SMR	San Marino	813,811,610	0
IRQ	Iraq		0
LBY	Libya		0
BMU	Bermuda		0
QAT	Qatar		0
CYM	Cayman Islands		0

Table 2. Major Countries Ranked by GCP per KGOE

Code	Country	GDPperKGOE	GDPKGOEind
HKG	Hong Kong, China	10.335	1
JPN	Japan	9.189	1
CHE	Switzerland	9.181	1
DNK	Denmark	8.219	1
IRL	Ireland	7.030	1

NOR	Norway	6.936	1
URY	Uruguay	6.878	1
GBR	United Kingdom	6.596	1
AUT	Austria	6.388	1
ITA	Italy	6.355	1
DEU	Germany	5.455	1
ISR	Israel	5.451	1
FRA	France	5.084	1
LUX	Luxembourg	5.001	1
SWE	Sweden	4.837	1
NLD	Netherlands	4.826	1
CRI	Costa Rica	4.653	1
PER	Peru	4.636	1
ESP	Spain	4.481	1
USA	United States	4.380	1
ARG	Argentina	4.300	0
BEL	Belgium	4.067	0
MEX	Mexico	3.718	0
AUS	Australia	3.686	0
SGP	Singapore	3.645	0
FIN	Finland	3.479	0
BRA	Brazil	3.258	0
CAN	Canada	3.004	0
KOR	Korea, Rep.	2.794	0
ISL	Iceland	2.526	0
VEN	Venezuela, RB	2.103	0
ARE	United Arab Emirates	2.052	0
DZA	Algeria	1.851	0
KWT	Kuwait	1.645	0
THA	Thailand	1.585	0
SAU	Saudi Arabia	1.503	0
AGO	Angola	1.195	0
IDN	Indonesia	1.032	0
CHN	China	1.024	0
IND	India	0.934	0
IRN	Iran, Islamic Rep.	0.797	0
KAZ	Kazakhstan	0.491	0
RUS	Russian Federation	0.462	0
NGA	Nigeria	0.460	0
GNQ	Equatorial Guinea		0
CYM	Cayman Islands		0
IRQ	Iraq		0
BMU	Bermuda		0
LBY	Libya		0
QAT	Qatar		0

SMR	San Marino		0

Table 3. Major Countries Ranked by GDP Per Capita (World Bank)

Code	Country	PCI_WB	PCI_WBind
LUX	Luxembourg	45,565	1
NOR	Norway	40,527	1
JPN	Japan	37,283	1
USA	United States	34,789	1
CHE	Switzerland	34,180	1
DNK	Denmark	30,204	1
ISL	Iceland	29,858	1
SWE	Sweden	27,662	1
IRL	Ireland	27,374	1
GBR	United Kingdom	25,226	1
HKG	Hong Kong, China	24,939	1
AUT	Austria	24,109	1
CAN	Canada	23,950	1
FIN	Finland	23,839	1
NLD	Netherlands	23,294	1
DEU	Germany	22,900	1
FRA	France	22,723	1
BEL	Belgium	22,390	1
SGP	Singapore	22,153	1
AUS	Australia	21,126	1
ARE	United Arab Emirates	19,717	0
ITA	Italy	19,027	0
ISR	Israel	17,395	0
KWT	Kuwait	15,631	0
ESP	Spain	14,408	0
KOR	Korea, Rep.	11,936	0
SAU	Saudi Arabia	8,680	0
ARG	Argentina	6,636	0
MEX	Mexico	5,801	0
URY	Uruguay	5,137	0
VEN	Venezuela, RB	4,503	0
CRI	Costa Rica	4,207	0
BRA	Brazil	3,560	0
GNQ	Equatorial Guinea	3,321	0
THA	Thailand	2,144	0
PER	Peru	2,084	0
RUS	Russian Federation	1,983	0
DZA	Algeria	1,823	0
IRN	Iran, Islamic Rep.	1,630	0
KAZ	Kazakhstan	1,533	0

CHN	China	983	0
AGO	Angola	803	0
IDN	Indonesia	761	0
IND	India	478	0
NGA	Nigeria	331	0
SMR	San Marino		0
CYM	Cayman Islands		0
BMU	Bermuda		0
IRQ	Iraq		0
LBY	Libya		0
QAT	Qatar		0

Table 4. Major Countries Ranked by GDP Per Capita (CIA)

Code	Country	PCI_CIA	PCI_CIAind
BMU	Bermuda	69,900	1
LUX	Luxembourg	68,800	1
GNQ	Equatorial Guinea	50,200	1
ARE	United Arab Emirates	49,700	1
NOR	Norway	47,800	1
CYM	Cayman Islands	43,800	1
IRL	Ireland	43,600	1
USA	United States	43,500	1
ISL	Iceland	38,100	1
DNK	Denmark	37,000	1
HKG	Hong Kong, China	36,500	1
CAN	Canada	35,200	1
SMR	San Marino	34,600	1
AUT	Austria	34,100	1
CHE	Switzerland	33,600	1
JPN	Japan	33,100	1
AUS	Australia	32,900	1
FIN	Finland	32,800	1
BEL	Belgium	31,800	1
NLD	Netherlands	31,700	1
SWE	Sweden	31,600	0
DEU	Germany	31,400	0
GBR	United Kingdom	31,400	0
SGP	Singapore	30,900	0
FRA	France	30,100	0
ITA	Italy	29,700	0
QAT	Qatar	29,400	0
ESP	Spain	27,000	0
ISR	Israel	26,200	0
KOR	Korea, Rep.	24,200	0

KWT	Kuwait	21,600	0
ARG	Argentina	15,000	0
SAU	Saudi Arabia	13,800	0
LBY	Libya	12,700	0
RUS	Russian Federation	12,100	0
CRI	Costa Rica	12,000	0
URY	Uruguay	10,700	0
MEX	Mexico	10,600	0
KAZ	Kazakhstan	9,100	0
THA	Thailand	9,100	0
IRN	Iran, Islamic Rep.	8,900	0
BRA	Brazil	8,600	0
DZA	Algeria	7,700	0
CHN	China	7,600	0
VEN	Venezuela, RB	6,900	0
PER	Peru	6,400	0
AGO	Angola	4,300	0
IDN	Indonesia	3,800	0
IND	India	3,700	0
IRQ	Iraq	1,900	0
NGA	Nigeria	1,400	0

Table 5. Major Countries Ranked by Oil Consumption

Code	Country	OilCons	OilConsind
USA	United States	20,730,000	1
CHN	China	6,534,000	1
JPN	Japan	5,353,000	1
DEU	Germany	2,650,000	1
RUS	Russian Federation	2,500,000	1
IND	India	2,450,000	1
CAN	Canada	2,294,000	1
BRA	Brazil	2,194,000	1
KOR	Korea, Rep.	2,149,000	1
FRA	France	1,977,000	1
MEX	Mexico	1,970,000	1
ITA	Italy	1,881,000	1
SAU	Saudi Arabia	1,845,000	1
GBR	United Kingdom	1,827,000	1
ESP	Spain	1,573,000	1
IRN	Iran, Islamic Rep.	1,510,000	1
IDN	Indonesia	1,084,000	1
NLD	Netherlands	946,700	1
THA	Thailand	900,000	1
AUS	Australia	877,300	1

SGP	Singapore	800,000	0
BEL	Belgium	641,000	0
VEN	Venezuela, RB	560,000	0
ARG	Argentina	470,000	0
ARE	United Arab Emirates	400,000	0
SWE	Sweden	362,400	0
IRQ	Iraq	351,500	0
KWT	Kuwait	335,000	0
NGA	Nigeria	290,000	0
HKG	Hong Kong, China	285,000	0
AUT	Austria	282,000	0
CHE	Switzerland	268,100	0
ISR	Israel	248,000	0
NOR	Norway	244,300	0
LBY	Libya	237,000	0
DZA	Algeria	233,000	0
FIN	Finland	220,400	0
KAZ	Kazakhstan	220,000	0
DNK	Denmark	185,300	0
IRL	Ireland	182,400	0
PER	Peru	156,000	0
QAT	Qatar	80,000	0
LUX	Luxembourg	62,420	0
AGO	Angola	48,000	0
CRI	Costa Rica	44,000	0
URY	Uruguay	38,100	0
ISL	Iceland	20,560	0
BMU	Bermuda	4,658	0
CYM	Cayman Islands	2,600	0
GNQ	Equatorial Guinea	1,220	0
SMR	San Marino		0

Table 6. Major Countries Ranked by Oil Production

Code	Country	OilProd	OilProdind
SAU	Saudi Arabia	9,475,000	1
RUS	Russian Federation	9,400,000	1
USA	United States	7,610,000	1
IRN	Iran, Islamic Rep.	3,979,000	1
CHN	China	3,631,000	1
MEX	Mexico	3,420,000	1
NOR	Norway	3,220,000	1
CAN	Canada	3,135,000	1
VEN	Venezuela, RB	3,081,000	1
NGA	Nigeria	2,451,000	1

KWT	Kuwait	2,418,000	1
ARE	United Arab Emirates	2,396,000	1
IRQ	Iraq	2,093,000	1
BRA	Brazil	2,090,000	1
GBR	United Kingdom	2,075,000	1
LBY	Libya	1,720,000	1
AGO	Angola	1,600,000	1
DZA	Algeria	1,373,000	1
KAZ	Kazakhstan	1,300,000	1
IDN	Indonesia	1,061,000	1
QAT	Qatar	790,500	0
IND	India	785,000	0
ARG	Argentina	745,000	0
AUS	Australia	530,000	0
GNQ	Equatorial Guinea	420,000	0
DNK	Denmark	391,400	0
THA	Thailand	230,000	0
DEU	Germany	167,400	0
ITA	Italy	145,100	0
JPN	Japan	120,600	0
PER	Peru	120,000	0
NLD	Netherlands	95,800	0
FRA	France	77,690	0
ESP	Spain	31,250	0
AUT	Austria	25,360	0
BEL	Belgium	10,690	0
SGP	Singapore	9,701	0
FIN	Finland	9,105	0
KOR	Korea, Rep.	7,378	0
ISR	Israel	3,209	0
SWE	Sweden	3,208	0
CHE	Switzerland	2,241	0
URY	Uruguay	514	0
CRI	Costa Rica		0
BMU	Bermuda		0
SMR	San Marino		0
IRL	Ireland		0
LUX	Luxembourg		0
HKG	Hong Kong, China		0
ISL	Iceland		0
CYM	Cayman Islands		0

Table 7. Major Countries Ranked by Oil Reserves

Code	Country	OilRes	OilResind

SAU	Saudi Arabia	262,700,000,000	1
CAN	Canada	178,900,000,000	1
IRN	Iran, Islamic Rep.	132,500,000,000	1
IRQ	Iraq	112,500,000,000	1
ARE	United Arab Emirates	97,800,000,000	1
KWT	Kuwait	96,500,000,000	1
VEN	Venezuela, RB	75,270,000,000	1
RUS	Russian Federation	74,400,000,000	1
LBY	Libya	42,000,000,000	1
NGA	Nigeria	36,250,000,000	1
KAZ	Kazakhstan	26,000,000,000	1
AGO	Angola	25,000,000,000	1
USA	United States	22,450,000,000	1
CHN	China	16,100,000,000	1
QAT	Qatar	15,200,000,000	1
MEX	Mexico	12,490,000,000	1
BRA	Brazil	12,220,000,000	1
DZA	Algeria	11,000,000,000	1
NOR	Norway	9,859,000,000	1
IND	India	5,600,000,000	1
IDN	Indonesia	4,850,000,000	0
GBR	United Kingdom	4,500,000,000	0
AUS	Australia	3,664,000,000	0
ARG	Argentina	2,116,000,000	0
DNK	Denmark	1,230,000,000	0
ITA	Italy	586,600,000	0
THA	Thailand	583,000,000	0
GNQ	Equatorial Guinea	563,500,000	0
DEU	Germany	395,800,000	0
PER	Peru	370,000,000	0
FRA	France	144,300,000	0
NLD	Netherlands	88,060,000	0
AUT	Austria	84,300,000	0
JPN	Japan	29,290,000	0
ESP	Spain	10,500,000	0
ISR	Israel	1,920,000	0
CYM	Cayman Islands		0
URY	Uruguay		0
CHE	Switzerland		0
SWE	Sweden		0
BEL	Belgium		0
BMU	Bermuda		0
SMR	San Marino		0
HKG	Hong Kong, China		0
LUX	Luxembourg		0

CRI	Costa Rica		0
KOR	Korea, Rep.		0
FIN	Finland		0
IRL	Ireland		0
ISL	Iceland		0
SGP	Singapore		0

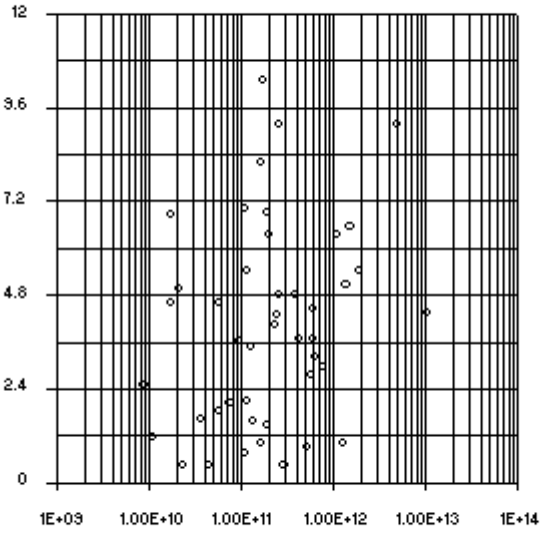
While the preceding tables are useful in identifying “interesting” countries with respect to oil, it is generally the case that two indicators are simultaneously of interest. For example, in examining countries that are high consumers of oil, it is desirable to consider also the industrial development of the country (as reflected in PCI) or the energy-efficiency of the country (as reflected in GDPperKGOE). To facilitate this, the following seven graphs are presented, showing the relationship of oil consumption, production and reserves to PCI and GDP per KGOE. It is not the purpose of these graphs to suggest a causal relationship between the two variables plotted (although there may be some in some cases). The graphs are simply to facilitate identification of countries in terms of two variables instead of one.

In many analyses of this sort, countries are shown by dots or circles on the graph, as shown in Figure 1a. In this analysis, we are interested in identifying particular countries in certain parts of the graph, and so the plotting point is represented by the three-letter World Bank country code (given in the above tables). This is illustrated in Figure 1b, which is identical to Figure 1a, except that the plotted circles are replaced by World Bank country codes. In some cases, the country codes overlap; clarification may be determined by consulting the various ranking tables. In many cases, the data are plotted using a logarithmic scale, in order to spread the data out (since they cover several orders of magnitude and many of the countries are small). This is not done in the case of ratio indicators such as PCI or GDP per KGOE.

Note that PCI and GDP per KGOE are not available for Libya, and so it does not appear in the graphs that follow.

Figure 1a. Plot of GDP per KGOE vs. GDP

GDPperKGOE v. GDP



GDPperKGOE

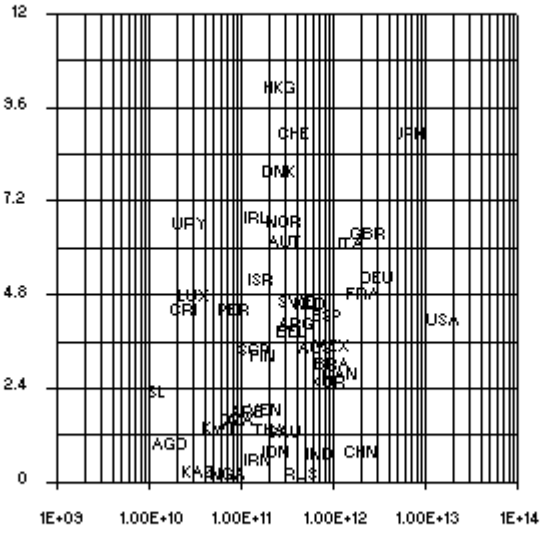
No. of obs.= 44
Restriction: None
Table: OilStatsMajorCountries
Database: C:\Graph1_2007\OilStats.mdb

GDP (log. scale)

Source: Joseph George Caldwell, based on World Bank and CIA data.
Date: 21 Feb 2007
Time: 02:49:54 PM

Figure 1b. Plot of GDP per KGOE vs. GDP

GDPperKGOE v. GDP



GDPperKGOE

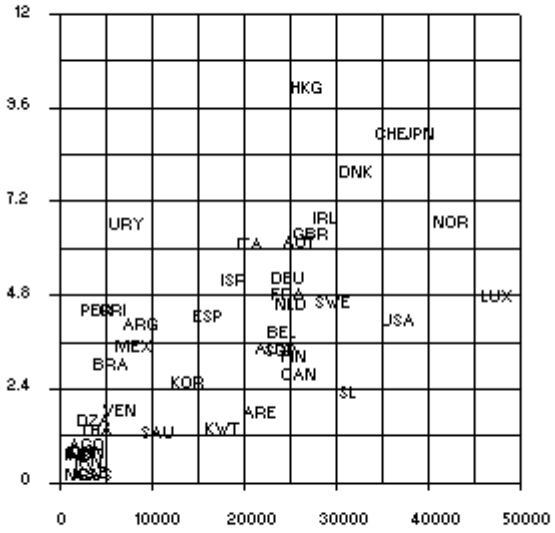
No. of obs.= 44
Restriction: None
Table: OilStatsMajorCountries
Database: C:\Graph1_2007\OilStats.mdb

GDP (log. scale)

Source: Joseph George Caldwell, based on World Bank and CIA data.
Date: 21 Feb 2007
Time: 02:47:45 PM

Figure 2. Plot of GDP per KGOE vs. Per Capita Income

GDPperKGOE v. PCI_WB



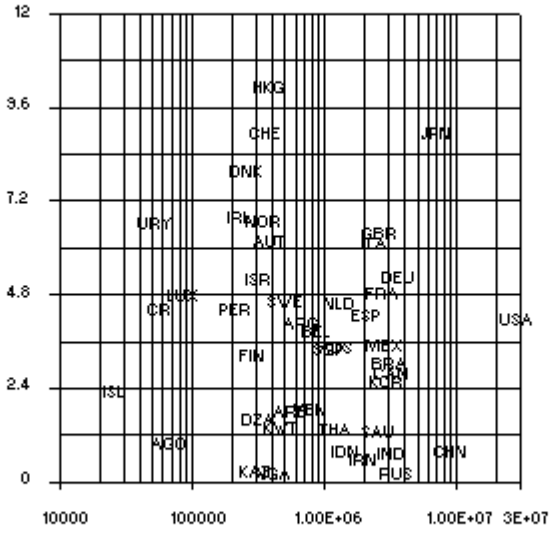
PCI_WB

No. of obs.= 44
Restriction: None
Table: OilStatsMajorCountries
Database: C:\Graph1_2007\OilStats.mdb

Source: Joseph George Caldwell, based on World Bank and CIA data.
Date: 21 Feb 2007
Time: 02:44:46 PM

Figure 3. Plot of GDP per KGOE vs. Oil Consumption

GDPperKGOE v. OilCons



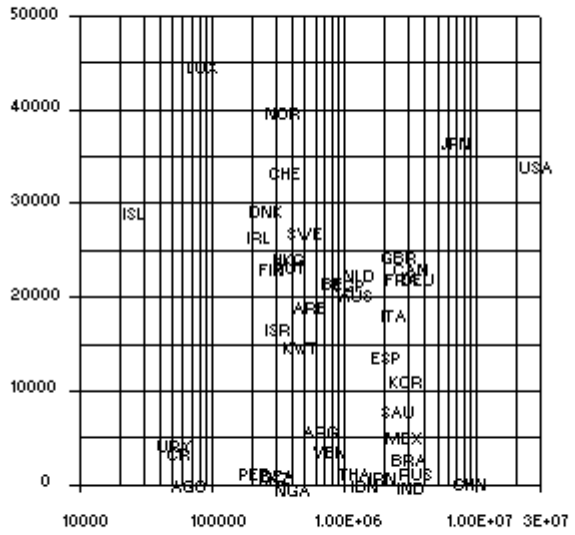
OilCons (log. scale)

No. of obs.= 44
Restriction: None
Table: OilStatsMajorCountries
Database: C:\Graph1_2007\OilStats.mdb

Source: Joseph George Caldwell, based on World Bank and CIA data.
Date: 21 Feb 2007
Time: 02:22:02 PM

Figure 4. Plot of Per Capita Income vs. Oil Consumption

PCI_WB v. OilCons



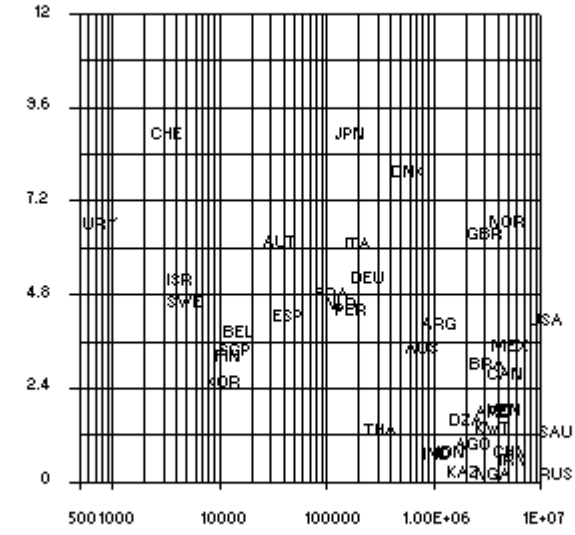
No. of obs.= 45
Restriction: None
Table: OilStatsMajorCountries
Database: C:\Graph1_2007\OilStats.mdb

OilCons (log. scale)

Source: Joseph George Caldwell, based on World Bank and CIA data.
Date: 21 Feb 2007
Time: 02:28:05 PM

Figure 5. Plot of GDP per KGOE vs. Oil Production

GDPperKGOE v. OilProd



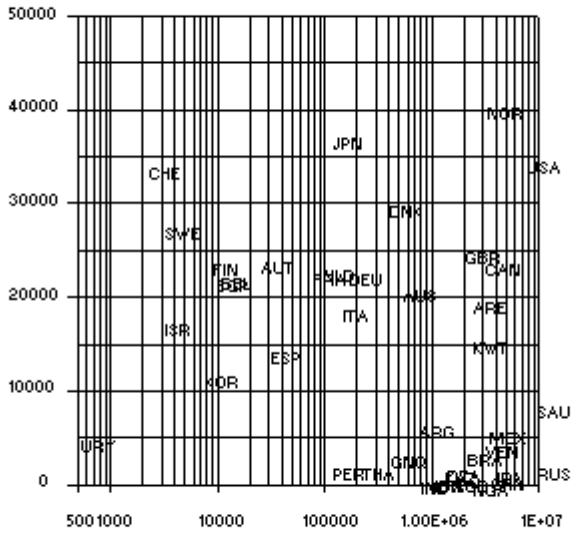
No. of obs.= 39
Restriction: None
Table: OilStatsMajorCountries
Database: C:\Graph1_2007\OilStats.mdb

OilProd (log. scale)

Source: Joseph George Caldwell, based on World Bank and CIA data.
Date: 21 Feb 2007
Time: 02:32:43 PM

Figure 6. Plo of Per Capita Income vs. Oil Production

PCI_WB v. OilProd



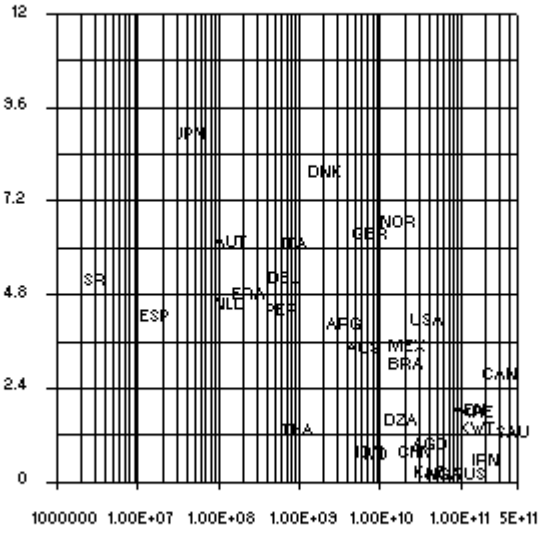
No. of obs.= 40
Restriction: None
Table: OilStatsMajorCountries
Database: C:\Graph1_2007\OilStats.mdb

OilProd (log. scale)

Source: Joseph George Caldwell, based on World Bank and CIA data.
Date: 21 Feb 2007
Time: 02:34:50 PM

Figure 7. Plot of GDP per KGOE vs. Oil Reserves

GDPperKGOE v. OilRes

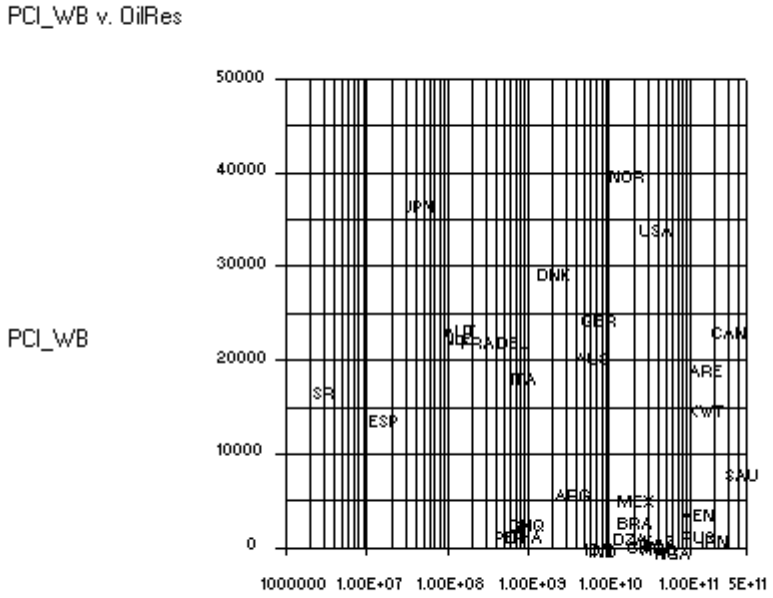


No. of obs.= 32
Restriction: None
Table: OilStatsMajorCountries
Database: C:\Graph1_2007\OilStats.mdb

OilRes (log. scale)

Source: Joseph George Caldwell, based on World Bank and CIA data.
Date: 21 Feb 2007
Time: 02:38:45 PM

Figure 8. Plot of Per Capita Income vs. Oil Reserves



Some Observations on the Tables and Graphs

Some observations may now be made from the tables and graphs presented above.

Oil-significant countries are of interest because of the magnitude of their oil consumption, their oil production, and their oil reserves. These aspects are of interest, however, for different reasons. Countries having large oil reserves are of long-term strategic importance. Countries having large production are of significant current interest. Countries having large consumption are competitors for oil use. We shall now take a look at each of these aspects of oil significance.

From the cursory analysis presented earlier, the following countries were identified as countries of high interest with respect to oil, at the present time. Saudi Arabia, Iran, Mexico, Venezuela, Nigeria, Brazil, Kazakhstan, United Arab Emirates, Kuwait, Libya, Qatar, and Algeria. Iraq is not included in this list, since it is already occupied by the US.

From Figure 1b (plot of GDP per KGOE vs. GDP), we see that there is little relationship, across countries, between economy size (reflected in GDP) and energy efficiency (GDP per KGOE).

From Figure 2 (plot of GDP per KGOE vs. PCI), we see that there is a positive relationship between energy efficiency (GDP per KGOE) and economic development (PCI). Of the ten least-economically-developed ("poorest") countries (Nigeria, India, Indonesia, Angola, China, Kazakhstan, Iran, Algeria, Russia, and Peru), eight of them (Nigeria, Russia, Kazakhstan, Iran, India, China, Indonesia and Angola) are among the ten least-energy-efficient countries in the

world. (There is no suggestion made here that economic development tends to cause high energy efficiency, or vice versa – there is just a positive relationship.)

In the remaining graphs, we are plotting an index (a ratio, either PCI or GDP per KGOE) versus an absolute quantity, and so it is not expected to see relationships on these graphs. It is possible that these indices might be related to sheer size, but that is not the point of these graphs – they are presented simply to see where the oil-significant countries stand with respect to two variables simultaneously.

Figures 3 and 4 are plots of oil consumption vs. energy efficiency (GDP per KGOE, Figure 3) and economic development (PCI, Figure 4). Countries that have high oil consumption and low energy efficiency are not making very productive use of the world's oil, from an economic viewpoint. (As oil becomes harder and harder to extract, the oil-rich countries will consume ever-greater amounts of energy to extract it, up to the point at which the energy required to extract it is equal to the energy provided by it. At that point, production ceases, regardless of the price.)

From Figure 3 (plot of GDP per KGOE vs. oil consumption), we see that the countries that have high oil consumption and low energy efficiency are China, Russia, and India. As discussed earlier, these countries will not be attacked over oil at the present time, since they are militarily powerful. The next-lower-consuming countries that have low energy efficiency are Saudi Arabia, Iran, Indonesia and Thailand. Saudi Arabia cooperates with the US in spending its petrodollars in the US, and so is not a concern. Iran, Indonesia, and Thailand, then, stand out as countries that consume large amounts of oil, and are very energy-inefficient.

Figure 4 shows that these three countries (Iran, Indonesia, and Thailand) are among the less economically developed countries in the world (as reflected by PCI).

Figures 5 and 6 are plots of oil production vs. energy efficiency and economic development. From Figure 5, we see that the following countries are high producers and very energy-inefficient: Saudi Arabia, Russia, Iran, China, Venezuela, and Nigeria. From Figure 6, we see that the following countries are high producers and of low economic development: Russia, Iran, China, Nigeria, Angola, Algeria. Kazakhstan, Indonesia and India. (Note: No PCI or GDP per KGOE data on Libya – it would likely also be included in this list.)

Figures 7 and 8 are plots of oil reserves vs. energy efficiency and economic development. From Figure 7, we see that the following countries have large oil reserves and are very energy-inefficient: Saudi Arabia, Iran, United Arab Emirates, Kuwait, Venezuela, Russia, Nigeria, Kazakhstan, Angola, China and Algeria. From Figure 8, we see that the following countries have large oil reserves and are of low economic development: Iran, Russia, Nigeria, Kazakhstan, Angola, China and Algeria. (Note: No PCI or GDP per KGOE data on Libya – it would likely also be included in this list.)

A Prediction

The following is the list of the oil-significant countries identified earlier: Saudi Arabia, Iran, Mexico, Venezuela, Nigeria, Brazil, Kazakhstan, United Arab Emirates, Kuwait, Libya, Qatar, and Algeria. Of these countries, Saudi Arabia, UAE, Kuwait, and Qatar are not of concern, because they spend large portions of their petrodollars with the West. Mexico, Venezuela and

Brazil are moderately economically developed, and trade much with the West. The countries that remain are Iran, Kazakhstan and Nigeria – and probably also Libya, for which PCI and GDP per KGOE data were not available.

Iran, Kazakhstan, Nigeria and Libya. These countries are not highly economically developed and energy-inefficient. They consume large amounts of oil: Iran 1.5 million bbl/day; Kazakhstan 220,000 bbl/day; Nigeria 290,000 bbl/day; and Libya 237,000 bbl/day. They produce large amounts of oil: Iran 4 million bbl/day; Kazakhstan 1.3 million bbl/day; Nigeria 2.5 million bbl/day; and Libya 1.7 million bbl/day. They possess large oil reserves: Iran 132 billion bbl; Kazakhstan 26 billion bbl; Nigeria 36 billion bbl; and Libya 42 billion bbl. Based on these figures (and the earlier considerations), they stand out as potential targets for conquest over oil.

Kazakhstan is not considered a target, since it falls well within the Russian sphere of influence.

Libya is not considered as attractive a target as Nigeria. At the present time, it is stable and not a military threat to the US. It is cooperating with the West (i.e., spends much of its oil wealth on Western goods and services). Barring an unforeseen development, Libya is not considered a high-likelihood target.

The US has bitten off more than it can chew in Iraq, pursuing the war there, as it is, with its hands tied. As long as it continues to wage war as incompetently as it has demonstrated in Iraq, it is unlikely to invade Iran, which is significantly richer, more powerful, and more technologically developed (it is also culturally quite different – Aryan vs. Arabic). Furthermore, Iran is on the verge of possessing nuclear weapons, and will soon be in a position to retaliate against the US, if attacked. It would appear that the US would consider at most a “remote” war against Iran, involving aircraft and missiles, with little on-the-ground action (as in the first Iraq war).

Nigeria is experiencing increasing civil strife between Christians and Moslems. Oil facilities are routinely illegally tapped and sometimes damaged and even sabotaged. Nigeria is in no position to defend itself against the US. Unlike Iraq or Iran, it would be easy to conquer and administer. It has good diplomatic and cultural relations with the US, and it would like to develop economically (i.e., spend its petrodollars with the US), but it is so corrupt that it is economically dysfunctional. (Nigeria ranks 142-150 out of 163 on Transparency International’s *Corruption Perception Index 2006*. An acquaintance of mine in Botswana once had a 21 million dollar well-drilling contract in Nigeria, and was forced to spend one third of it on bribes to get the job done.) From some indications, it seems to be on the verge of collapse.

Based on the preceding considerations, Nigeria is identified as the most likely target of a US invasion over oil. As mentioned, random events, such as Saddam Hussein’s saber-rattling in Iraq, Afghanistan’s harboring of bin Laden and other terrorists (and strategically located between the massive Caspian Sea oil and gas reserves and the Arabian Sea), Iran’s threat to build nuclear weapons, and more recently, Chavez’s rantings in Venezuela, could precipitate an unplanned reaction. If Iran does nothing further to provoke the US, my bet is that Nigeria is the next US target over oil. Forecasting the future is a notoriously risky business, but it is entertaining, and, at this stage of my life, I have little to lose in sticking my neck out.

The preceding musings have led to a candidate for the next US conquest over oil, in the near future. Predicting the long-term course of events is substantially easier. In the long term, as global oil supplies become inadequate to fuel the industrialized West, war will erupt on a global scale. At that point, supply and demand will no longer be brought into balance by price, but by

destruction of human population, at the average rate of about 200 million people per year. These wars will be among the developed nations, since the less-developed nations will have long-since perished. At some point, all countries of the world will be consumed in war, as the Petroleum Age comes to a close and the era of global industrialization ends.

The world is about to become a very exciting place.

"Cry Havoc!" and let slip the dogs of war.
-Shakespeare, Julius Caesar III.i.270