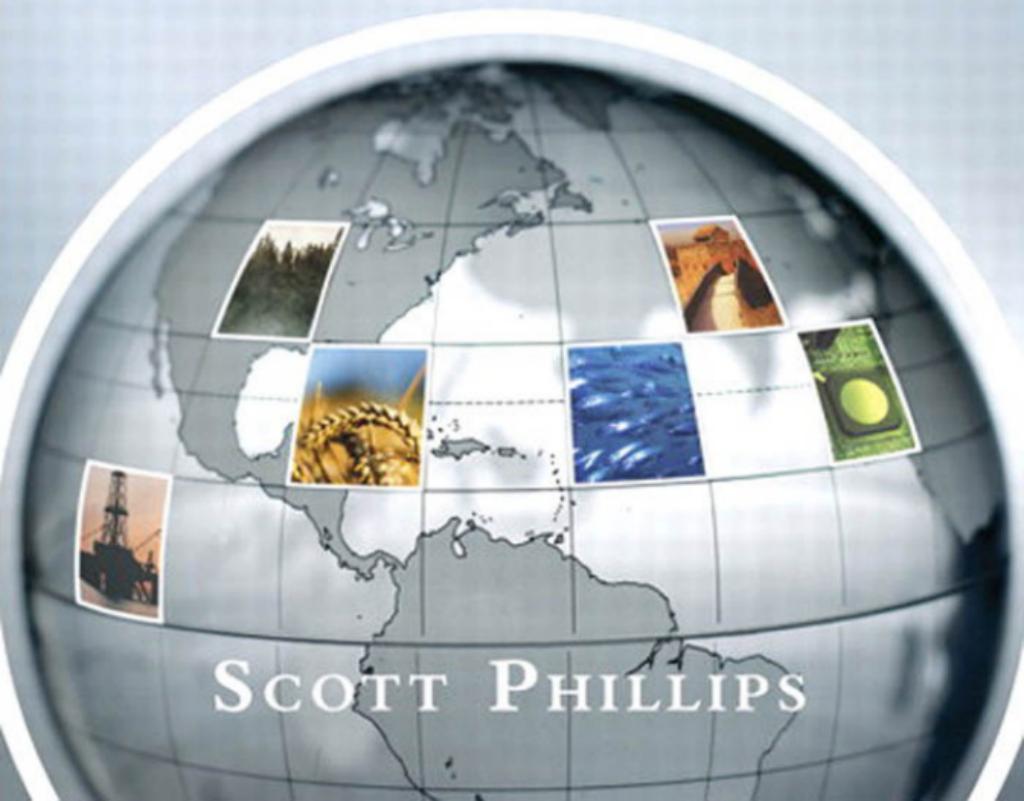


BUYING *at the* POINT of
**MAXIMUM
PESSIMISM**

SIX VALUE INVESTING TRENDS
FROM CHINA TO OIL TO AGRICULTURE



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Printed in the United States of America

First Printing May 2010

ISBN-10: 0-13-703849-6

ISBN-13: 978-0-13-703849-7

Pearson Education LTD.

Pearson Education Australia PTY, Limited.

Pearson Education Singapore, Pte. Ltd.

Pearson Education North Asia, Ltd.

Pearson Education Canada, Ltd.

Pearson Educación de Mexico, S.A. de C.V.

Pearson Education—Japan

Pearson Education Malaysia, Pte. Ltd.

Library of Congress Cataloging-in-Publication Data

Phillips, Scott, 1974-

Buying at the point of maximum pessimism : six value investing trends from China to oil to agriculture / Scott Phillips.

p. cm.

ISBN 978-0-13-703849-7 (hbk. : alk. paper) 1. Investments. 2. Stocks—Prices—Forecasting. I. Title.

HG4521.P495 2010

336.2—dc22

2009051970

Foreword

“Bull markets are born on pessimism, grow on skepticism, mature on optimism, and die on euphoria. The time of maximum pessimism is the best time to buy, and the time of maximum optimism is the best time to sell.”

—Sir John Templeton, February 1994

My late great uncle, Sir John Templeton, kept a plaque on his desk that read, “Trouble is opportunity.” He also coined the phrase “Investing at the point of maximum pessimism” to describe the optimal time to invest.

Buying at the point of maximum pessimism is more than a simple investment motto. It is a successful and time tested investment strategy that can significantly increase the odds of investment success in your favor. Accommodating the sellers, as my uncle always put it, is simple. But psychological inertia usually stands in the way of even the most rational investor during extreme market volatility. The most recent bear market is a prime example. Beginning with the collapse of two Bear Stearns hedge funds and ending with a bailout of the entire U.S. financial system, the recent crisis was no place for the faint of heart.

In the wake of these events, even the most seasoned investors proclaimed that the sky was indeed falling. It has always been interesting to me that during periods of market upheaval, perfectly rational individuals can and often do exhibit completely irrational behavior. Behavioral finance is a fascinating field of study. Regardless of the psychological or even biological reasons for the discomfort that many investors experience during a market correction, impediments to buying at the point of maximum pessimism exist.

In my opinion, the best prescription for the paralysis that often accompanies a stock market panic is advance preparation. We know that often the best opportunities present themselves during times of crisis. Most investors even recite the motto “Crisis equals opportunity,” but few investors have the fortitude to take advantage of these precious occasions. Because crisis usually occurs when least expected,

it is disturbing and usually induces our panic response. Investors must learn to look forward to these events and, more importantly, take advantage of them. For anyone who invested money throughout the bear market of 2007 through 2009, this represented a precious, if not once-in-a-generation, opportunity. Unfortunately for some, this opportunity may have been lost due to a lack of preparation for such intense volatility in stock prices and condensed selling in a short period of time. The most successful investors are prepared well in advance of market disruptions.

One technique that Uncle John always used to prepare himself for future market volatility was to maintain a list of stocks that he was interested in owning at a much lower price. This practice underscores the reality that the stock market is often too dynamic for anyone to predict with any accuracy. As investors, we should not spend all our time trying to predict or anticipate every move of the stock market. Instead, we should anticipate what actions we would take in order to capitalize on an opportunity should it present itself.

Following in the (albeit, very large) footsteps of my great uncle, my husband and I have made an investment career by continuously searching the world for bargain stocks on behalf of our investors. We believe that the long-term perspective on investing is not only applicable but also the best approach. In *Buying at the Point of Maximum Pessimism*, my husband Scott Phillips identifies several long-term investment opportunities in the stock market. Based on our research, we believe that these are long-term trends that should persist for many years to come. Investors might find it helpful to use the investment themes described in this book to refine their wish list of securities in order to capitalize on future market volatility. Moreover, the investment themes described in this book take into thoughtful consideration many of the abrupt changes that the global economy experienced in the wake of the financial crisis. In sum, this book should help investors prioritize investments as they seek to take advantage of points of maximum pessimism.

Happy bargain hunting!

Lauren C. Templeton

Principal and Founder

Lauren Templeton Capital Management, LLC

Introduction

In March 2009, the world stock markets unveiled a tremendous opportunity for bargain hunters. March 9, 2009 represented a new low in the 2007 through 2009 bear markets. To be more precise, the March 9 low represented a 57% decline in the S&P 500 from its previous high in October 2007. On a personal note, March 9, 2009 was a particularly exciting time for me. On that day, I sat in a hospital delivery room, simultaneously entering buy orders on my laptop and awaiting the birth of my daughter. To be sure, buying cheap stocks falls far short of becoming a father among life's precious moments. There is no comparison. Still, the gravitational pull of a bargain hunter to inexpensive stocks can overcome many obstacles, including a less than enthused delivery nurse. The response to buy during periods of sharp market turmoil is not totally unique; there are other stories of investors doing the same. However, the total amount of buyers in the stock market during March 2009 were clearly a minority. Otherwise, the market could not have reached such a low. Sir John Templeton always said, "The only way a stock can become a bargain is from other people's selling. There is no other way." That being said, nearly all investors can appreciate in hindsight the large number of bargain stocks created by the heavy selling in early 2009. The ability to recognize the opportunity in real-time, or possess the conviction to act on it, is a whole different matter. Clearly, there are psychological impediments to becoming a buyer in the stock market when it reaches a point of maximum pessimism. Overcoming these obstacles, however, is important because the minority of investors who were buying in March 2009 were likely rewarded for doing so. *Buying at the Point of Maximum Pessimism* is intended to help investors overcome these impediments when the market presents future buying opportunities.

Many investors view themselves as value investors or mention that they admire successful investors such as Sir John Templeton or Warren Buffett. Unfortunately, though, many investors find that they lack the conviction to buy when the market presents the greatest opportunities. Investors are commonly betrayed by their own short-sighted behavior when the greatest discounts appear in the market. The reason for this is clear; experiencing losses introduces uncertainty and a loss of confidence in one's own investments. Until investors can counteract this routine behavioral reaction to market selling, they may be prone to selling at the wrong time. More specifically, I am referring to investors' time-honored mistake of selling rather than buying at the bottom of a market. One significant step toward correcting this behavior is to prepare for these buying opportunities before they appear. Through this preparation, the investor learns not only to expect market sell-offs but also to look forward to these events. Ultimately, the goal of this preparation is to safeguard against the likely loss of confidence that every investor is susceptible to when the entire market falls in price. Once properly prepared for these events, an investor should be armed with the psychological fortitude to become a buyer during moments when most others in the market are sellers. The investor who wants to capitalize on points of maximum pessimism must be willing and prepared to replace the market's perspective with his own. When the market is pessimistic, the challenge to the bargain hunter is to be optimistic, and vice versa. During his long and famous career on Wall Street, Sir John Templeton developed numerous methods and strategies that were designed to overcome the psychological inertia presented by the market. He often kept standing limit orders on stocks at prices well below the market that would force buying activity at the right time. Likewise, he also maintained a wish list of stocks that he had researched in advance in his desk drawer that he could use to make purchases as the market presented opportunities. This book follows a similar thread of investment strategy in that it provides a group of investment themes that could be used in a wish-list manner, or to make purchases during market corrections or future points of maximum pessimism. Naturally, all these investment themes represented bargain opportunities in late 2008 and early 2009 as the market descended toward its lows. Many of these stock ideas remain attractive bargains as 2009 comes to

a close. Going forward, however, the attractiveness of the stock valuations tied to these themes may require some discretion. For this reason, the ideas may be most useful when applied during market corrections.

Buying at the Point of Maximum Pessimism introduces a half dozen investment themes that should maintain their fundamental appeal over the next five to ten years. The purpose of this book is to answer the question of what to buy during future bouts of market volatility. In sum, these themes could be thought of as CliffsNotes to be used in preparation for future tests in the stock market. These themes should help investors, at a minimum, inventory a list of investment ideas that may be applied over the years to come. The six investment themes described in this book are far from exhaustive. However, these themes have been targeted for their long-term nature. In addition to their longer time horizons, they also consider the growing risks created by policy makers around the globe, from their shortsighted responses to the financial crisis.

One substantial risk that is identified is the growing probability of a loss in the purchasing power of the U.S. dollar. We can all appreciate the large sums of money printed by governments in response to the financial crisis, but some investors may still be searching for ways to protect their hard-earned savings in the event that inflation rises. Inflation risk should be considered a staple risk to investment returns, irrespective of economic conditions. Inflation has been present for many decades in the markets, and the U.S. market has been no exception. For investors familiar with Sir John Templeton's methods, it is no surprise that among his "16 rules" for successful investing, targeting a real return after inflation and taxes is the number one rule on the list. Most relevant in the current environment, though, is that recent policy responses by the U.S. government to the financial crisis have increased this risk for future inflation. Many investors have become attuned to this risk, but the advice seems to largely be the same in most corners: Buy gold. Rather than offering the recommendation to purchase gold as a response, *Buying at the Point of Maximum Pessimism* highlights other areas for investment, such as oil and energy, as well as agribusiness. These investments have historically offered protection against a loss of purchasing power in the U.S. dollar and also possess attractive long-term growth drivers. In this

respect, the investment themes in this book illustrate the compelling fundamental growth drivers as a backdrop to investment in these spaces. The reason for this emphasis is that we cannot know with much certainty the future outcome of inflation, but we can become comfortable with the long-term dynamics of energy and agribusiness, including proteins. In the event that inflation appears, the investor still receives some protection, as indicated by historical relationships between commodities and the U.S. dollar. Conversely, the arguments for purchasing gold rest mostly on speculative outcomes as opposed to long-term growth drivers. In sum, the book presents investment themes that hold merit beyond attempting to protect against a loss of purchasing power.

Other risks that the book considers relate to the large amounts of both public and private indebtedness, as well as the increased scope for regulation that has resulted from policy makers' responses to the financial crisis. The discussion of these risks, as well as the aforementioned specter of inflation, requires some context. For that reason, the book begins with the events leading into, culminating with, and lingering from, the financial crisis of 2008 and early 2009. These discussions are not meant to provide a thorough history of the events, but instead help explain how the investment themes have developed. The basic idea is that investors have been left with a new landscape that they must contend with and seek opportunity within over the coming years. These chapters help provide a picture of this landscape.

In the chapters that follow this discussion, I arrive at the previously mentioned investment themes. These chapters describe in detail six investment themes that investors may find an opportunity to deploy over the years to come. From a top-level view, some of these investment themes will sound familiar. For instance, many investors understand that China offers long-term opportunity for continued growth. In this case, however, the book fleshes out the most salient aspects of this growth. It also offers better insights into more specific fundamental drivers, as well as areas to target for investment in the country's transition from a prototypical Asian exporter to a domestic economy. Still other investment themes, such as the state of the world's fisheries, or the rare earths discussed in Chapter 11, "A Rare Opportunity," may be less familiar to investors. They offer an opportunity to invest in areas with growth potential that have been neglected by investors.

In any event, the purpose of this book is to provide solutions to investors who are searching for long-term investments—in particular, what investments should be prioritized when the market presents future opportunities during a sell-off. Given the significant volatility in the stock market relative to these long-term investment themes, investors may find them most useful during future points of maximum pessimism, which is the best time to buy.

11

A Rare Opportunity

In 1992, Deng Xiaoping, the man who led China into its free-market reforms, made a rather arcane statement: “There is oil in the Middle East; there are rare earths in China.” While only some observers might have understood the implications of this proclamation a few decades ago, chances are that nearly everyone will come to view Deng’s words as prophecy in time.

To begin, a reasonable question may be, What is rare earth? Depending on your perspective, rare earth could refer to a rock band that had a few Top 40 hits for Motown in the early 1970s, or a set of elements clustered on the periodic table that you probably studied in high school chemistry. Not to take anything away from the band, but this chapter focuses on the rare earths from the science classroom. In practical terms, rare earths are actually nothing more than some ore materials that are mined from the ground. Rare earths, or rare earth metals as they are also called, are found in the third column of the periodic table. Typically, they are identified by their silvery to gray color, luster, and high electrical conductivity.

What makes them so relevant to the world we inhabit is that in spite of their “rare” name, they in fact are highly ubiquitous to the daily experience of most humans. Incidentally, rare earth applications comprise some of the basic raw materials of technology and have done so for decades. In a trivial sense, people may have marveled back in May 1953 at how scientists at RCA came up with the first color television. However, the answer is simple: a new application of the rare earth europium was used to form the red phosphors of the TV. Likewise, many people have seen video footage or photos of the early computers, which appeared to be the size of 18-wheelers, consuming an entire room, weighing many tons versus pounds, and

containing thousands of vacuum tubes, flashing lights, and controls. Today, people have computers that are exponentially more powerful than sit discreetly on their desks, thanks in part to advances in rare earth applications such as neodymium, which drove the miniaturization of the magnetic disk drive. Far from even recognizing the critical role these metals play in their lives, people might be surprised to discover that without the rare earth europium creating the red phosphor in the cathode ray tube and the LCD display, there could be no color televisions or computer screens. In a similar vein, without the rare earth erbium, there could be no fiber-optic cables connecting the world in a dazzling web of efficient, high-speed communication. Most developed-market consumers take for granted their cell phones, TVs, and iPods, even as these devices become increasingly miniaturized. Miniaturization in consumer technology devices is often the result of a new rare earth application such as neodymium magnets in the iPod. The medical field uses rare earth applications in its MRIs and CT scans, and sophisticated defense departments use rare earth applications in their guided missiles, lasers, and smart bombs. With that said, it should be apparent that people come into contact with rare earth materials daily whether they realize it or not. Much of our modern economies and societies would be crippled without their applications. We have all heard someone proclaim that he does not know what he would do without his cell phone, or he could not live without his computer. We can see that a critical rare earth application lies behind many of the technological advances and devices that citizens of the twenty-first century now take for granted.

Demand for Global Technology Remains Strong

To be sure, we can expect demand for technology, and therefore its raw materials, to continue to grow at a steady pace. This will be particularly true as we look to emerging-market consumers as a source of future growth. Consider a simple proxy for technology demand, such as cell phone handsets. We can see that in large developing markets such as China and India, cell phone penetration rates remain well below developed-market standards and still have much room for future growth as their economies continue to advance. For

example, cell phone penetration rates in China and India are approximately half those of the developed-market levels found in North America and Western Europe, as shown in Table 11.1.

TABLE 11.1 Selected Global Cell Phone Penetration Rates

	2005	2006	2007	2008	2009	2010	2011
India	6%	11%	17%	24%	31%	39%	44%
China	28%	32%	37%	43%	50%	56%	59%
Northern America	68%	76%	82%	86%	89%	91%	95%
Western Europe	85%	89%	95%	98%	97%	99%	99%

Source: IDC, ITU, Bank of America—Merrill Lynch

If we turn to other major consumer-driven technology categories such as LCD panels, we discover a similarly low base of penetration. Based on research from Morgan Stanley,¹ the rate of LCD panel penetration is currently about 10% in China, and the installed penetration base of other televisions is closer to 80%. This suggests that there will be much additional room for growth in this industry as consumers over time replace their CRT TVs with LCD TVs.

Irrespective of the compelling data that suggests continued technology demand growth in the emerging markets, these are just two simple proxies for future growth in consumer technology devices. In the cases we just discussed, we highlighted the demand for technology among emerging-market consumers who are still entering the modern economy through the process of globalization. Still though, even within the broader confines of technology across all profiles of economies, whether developed or developing, there is scope for continuous new demand thanks to the critical role of innovation in the field. So although the developed markets may possess cell phone penetration rates of around 100%, we would be remiss to think that product demand does not ebb and flow on the basis of innovation in these markets. One fine example comes from the emergence of the smartphone within the mobile device space, since these products are continuing to redefine the capabilities of handheld technology productivity. Technology producers continue to bring new value propositions to end users by offering them increased computing

power, messaging capabilities, video and audio capabilities, and mobile Internet. As long as this happens, it is probable that even within a mature market such as the United States, demand can be created anew for rare earth applications on the basis of these devices. So in this sense, technology is a unique industry because of its constant upheaval and obsolescence. This reality poses challenges and risks to investors who are unable to detect or anticipate these technological advances. At the same time, the constant drive toward product innovation generates a steady demand for the rare earth materials that drive innovation or that remain essential to the device's construction. So in other words, no matter what device comes into the fore of industry demand, there will likely be a continued new source of demand for rare earths, since these materials are often essential to the device. In the case of the smartphone, Figure 11.1 shows that, based on a collection of industry sources, this product is projected to represent 24% of global handset volume, or more than twice its 2007 level. From the perspective of a rare earth supplier or fabricator, even demand in the mature markets will continue to grow thanks to the role of innovation alone.

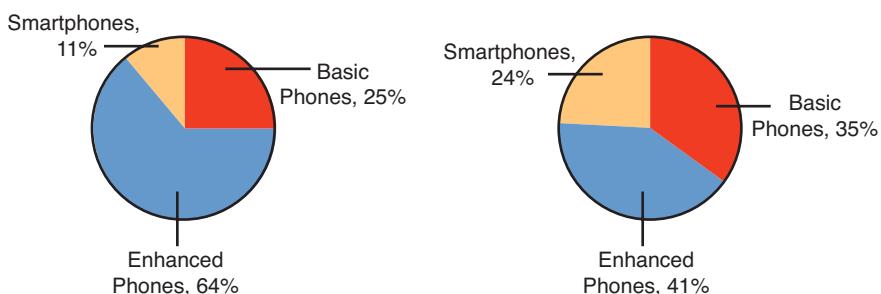


Figure 11.1 Global handset volume mix in 2007 and 2015, estimated

Source: Gartner, CSFB

Based on our discussion of demand drivers, we can now appreciate that technology demand can occur from two principal backdrops: increased access from new users, and upgrades from existing users as new technologies unfold in the market. Thus far, we have discussed rare earths and their end products only from the standpoint of consumer handheld devices and TVs, which is, incidentally, a narrow focus. This does the materials a disservice, because they are critical

components of yet another developed-market demand driver that has taken on greater social significance. With that said, these raw materials are also significant because of growing demand from a trend that is under way in the developed markets relating to energy conservation, eco-friendly practices, and, generally speaking, all the manifestations of environmentalism in the form of technology application.

It's Not Easy Being Green

As you will recall from our earlier discussion of the growing scope of government regulation and its general intrusion into the private sector, one of the major socioeconomic objectives propelling this activity is the advancement of a green economy. One of the largest conduits for this industrial policy that has been pushed by the Obama administration is the U.S. government's 60% ownership of General Motors. GM recently announced its plans to, in the words of its North American president, "become the greenest car company in the world." As it turns out, a good bit of rare earth material is required to manufacture many green energy technologies, including hybrid automobiles and wind turbines. For example, the electric motor of the most popular hybrid vehicle, the Toyota Prius, requires between 2 and 4 pounds of the rare earth metals neodymium and dysprosium. Its battery uses 20 to 30 pounds of the rare earth lanthanum. The same will likely apply to the much-ballyhooed Chevy Volt when it hits the streets with its reported 230-miles-per-gallon fuel economy, because it too will require a considerable amount of rare earth material. Table 11.2 shows how prevalent rare earths are in the construction of the Prius, along with its broad assortment of applications.

TABLE 11.2 The Toyota Prius and Its Many Applications of Rare Earths

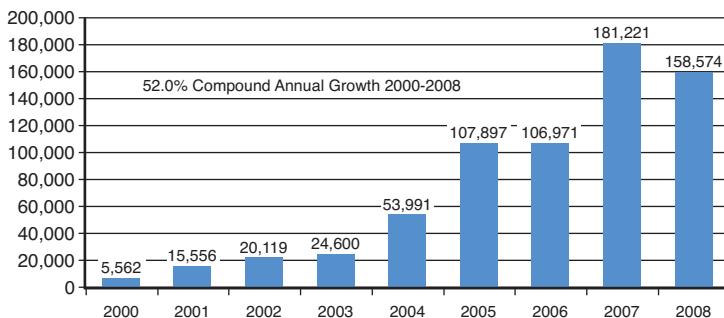
Rare Earth	Application
Cerium	Glass and mirrors polishing powder, UV cut glass, diesel fuel additive, hybrid NIMH battery, catalytic converter, LCD screen
Europium	LCD screen
Lanthanum	Diesel fuel additive, hybrid NIMH battery, catalytic converter
Neodymium	Hybrid electric motor and generator, magnets for more than 25 motors throughout the vehicle

TABLE 11.2 The Toyota Prius and Its Many Applications of Rare Earths

Rare Earth	Application
Praseodymium	Hybrid electric motor and generator
Terbium	Hybrid electric motor and generator
Yttrium	LCD screen
Zirconium	Catalytic converter

Source: Arafura Resources, IMCOA

Just as important as the Prius's overall consumption of rare earth is the growing consumption of the Prius by drivers around the world. Figure 11.2 shows the Prius's growing popularity; its U.S. sales grew 52% from 2000 to 2008. As we just said, the green movement has become a significant secular trend in the United States and other high-income nations, and many consumers participate by purchasing goods that contribute to the movement or at least announce their support for a green lifestyle.

**Figure 11.2 U.S. sales of the Toyota Prius (unit volume)**

Source: U.S. Department of Energy

Because of the popularity of the Prius, and the copycat nature of the auto industry, nearly all the manufacturers are following suit with their own hybrid vehicles. This spells even further future demand for rare earth materials. Based on projections by Goldman Sachs² (and shared by others), the market for hybrid vehicles is expected to reach ten million units by the year 2020 (see Figure 11.3). This represents a compound annual growth of 27%. Although this growth may seem

robust, industry forecasters are largely taking their cue from the auto manufacturers themselves, because they are making capital investments that could support this level of volume in 2020. Based on Toyota's success in the market, they plan to produce over one million hybrids per year after 2010. The underlying logic of reaching ten million hybrid vehicles in 2020 is that hybrids will compose 10% of global auto sales at that point. Viewed in this light, the projection does not appear unreasonable. If this does not come to fruition, it will not be from a lack of trying on the part of developed-market governments through regulation and developed-market consumers further embracing green lifestyles. In May 2009, President Obama announced that the preexisting Corporate Average Fuel Economy (CAFE) standards that were in place for 2020 would be pulled forward to 2016. This means that fuel efficiency standards will need to improve by 40%, to 35 miles per gallon from the current 25 miles per gallon. Given that this standard is too onerous for conventional engines, these new regulations should push manufacturers to sell a higher percentage of hybrid vehicles. In fact, even meeting the previous CAFE standards was too hard and led to lighter, less-safe cars rather than the desired innovations in fuel efficiency. Unfortunately, several studies have demonstrated that the first CAFE standards increased annual traffic fatalities by 2,000 people per year. In any event, in keeping with the manufacture of additional hybrid vehicles, we can anticipate an accompanying relative surge in demand for rare earth materials.

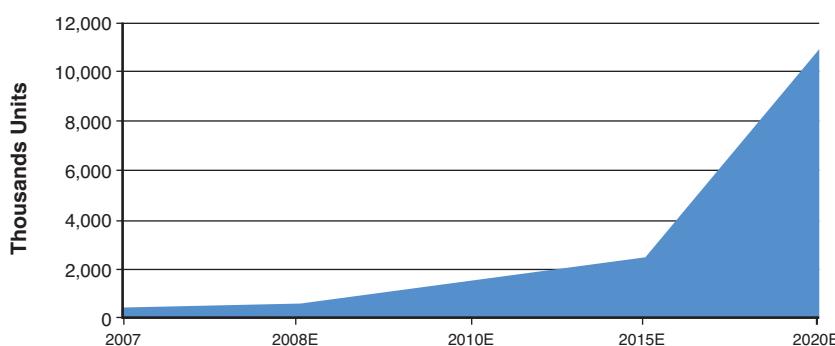


Figure 11.3 Hybrid vehicle market forecast through 2020

Source: Goldman Sachs

Meanwhile, the Prius and other hybrid vehicles are not the only green technologies starving for rare earth applications. A utility-scale wind turbine reportedly uses over 700 pounds of neodymium. In line with its green makeover for the economy, the U.S. government is also pushing hard and fast toward a substantial build-out of wind turbine-generated energy for electricity (see Figure 11.4). The U.S. Department of Energy published a report titled “20% Wind Energy by 2030” that details this ambition. Naturally, it parades a host of economic benefits, ranging from the number of newly created green jobs to new tax revenues on the properties occupied by the turbines. Although they are well and good, these plans will help push rare earth demand into overdrive, especially when combined with the natural growth in the technology devices and hybrid vehicles mentioned earlier. According to an estimate by rare earth industry consultant Jack Lifton, an efficient wind turbine requires one ton of neodymium per megawatt of generating capacity. This implies that the government’s wind turbine construction plans alone would soak up approximately 60% of the annual production of neodymium based on the current level of production. The program will hit its stride in 2017 to 2018. Although this is unlikely to happen, for a number of reasons, it just provides another view of how hungry the world is for rare earths.

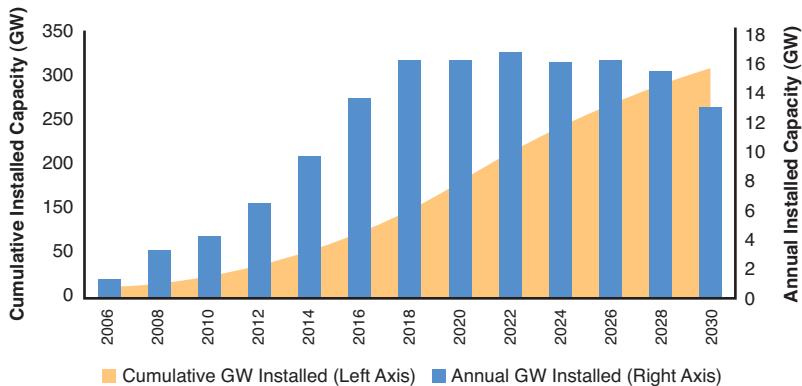


Figure 11.4 Annual and cumulative wind installations by 2030

Source: Department of Energy

Another bright idea from the regulators was to phase out the use of incandescent light bulbs in the United States by 2012. Based on regulations set forth in the Energy Independence and Security Act of

2007, the good old trusty light bulbs invented by Edison will no longer be available. Instead, consumers must turn to the more efficient (and expensive) compact fluorescent light (CFL), along with its neurotoxic levels of mercury and its necessary rare earth materials of yttrium/europium and lanthanum/cerium/terbium. The good news is that this too will help propel demand for rare earths, because tungsten bulbs will also be phased out in Europe, Australia, and some developing countries in Asia. The bad news is that consumers might also become irritated by having to double-bag burned-out CFL bulbs in Ziploc bags before putting them in the trash, or having to take them to a recycling center. Perhaps Kermit the Frog had it right when he said, “It’s not easy being green.”

There Is Oil in the Middle East; There Are Rare Earths in China

So far, we have discussed the demand for technology and the easily discernible accelerating demand for green technologies, ranging from hybrid vehicles, to wind turbines, to fluorescent bulbs. The world has a substantial appetite for the rare earth materials that are absolutely essential to the production of these products. The acknowledgment of this surging demand prompts the question, Who supplies rare earth?

The answer returns us to our opening mention of Deng Xiaoping, and a somewhat unsettling reality for technology companies around the world: One country ostensibly controls the entire world's current supply of rare earth—China.

For much of the first decade of the twenty-first century, China was often noted for its relative paucity of vital commodities needed for the construction of its growing economy, including copper, cement, and forest products. These supply-and-demand relationships have been real, but as it turns out, the country controls the supply of commodities that is the bedrock for all current and future innovation in technology. As obscure as his statement was in 1992, Deng had it right—China has rare earth. In fact, by most recent estimates, the country controls from 95% to 97% of the world's current supply of rare earth raw materials. iPods, cell phones, LCD TVs, hybrid

vehicles, wind turbines, computers, and, yes, even fluorescent light bulbs are drawing on the production of rare earth materials that are supplied almost entirely by this one country. Concern is growing over this supply-and-demand dynamic, because some observers are worried that China will hold the world hostage. This outcome is very unlikely, barring any unprompted and totally ill-advised trade war coming from elsewhere. China's goal is to find the best way to monetize its asset. If China were to pursue this course of action, and prices rose too high, there would be a supply response in time from other countries such as Australia, Canada, Brazil, and the United States. All these countries possess these assets in some way, shape, or form, but in lower concentrations and at higher costs of production. Actually, rare earth materials are found all over the globe in the crust of the Earth. Conversely, finding a heavy concentration of these materials in one place, and extracting them in an economical way, is a totally different story. For this reason, China sits on the world's most abundant localized supply of rare earth. In a fit of irony, it is also an inconvenient truth that the key ingredients of all these important green technologies are extracted through a highly ungreen and polluting process. Most often, the crude form of the process has involved applying acid directly to the ore source in the ground that in turn leaches the ore from the other soil materials but leaves the acid behind. For that reason, the United States' own source of rare earth raw materials in Mountain Pass, Calif., which saw its production heyday during the initial boom in color TVs, was mothballed years ago. Not surprisingly, China—as always, stereotyped by its notoriety for exploiting natural resources for profit (just like the United States 100 years earlier)—was left as one of the few producers. Other governments killed the industry with regulation for its potentially contaminative processes. In the past few years, though, a consortium of private equity investors have backed a firm named Molycorp to begin production at Mountain Pass. Numerous other announcements in the past few years have come from mining companies in Canada and Australia. However, optimistically speaking, it will take years for these projects to come online, and then a few more years to reach full production, while technology demand continues to pace ahead. The announced projects to date represent only a fraction of the output from China, which still holds about 80% of the market. For that matter, these are optimistic scenarios for production responses from

outside China. Mining rare earths is far from simple, and refining them into something useable is a whole other ball of wax. One good example comes from Lynas Corp. of Australia, which is working on rare earth extraction from the Mount Weld project in that country. After decades of commercial interest, the project has yet to produce the materials. The capital it needs to subsist has been choked off—at least intermittently thanks to the financial crisis. Here again, we find strong evidence of another headwind facing the production of rare earth from locations outside China. Ever since the financial crisis, capital has become much scarcer. More importantly, capital-seeking risky ventures such as getting in on the ground floor of a start-up mining project are becoming scarce, notwithstanding the attractiveness of the opportunity, thanks to good old-fashioned risk aversion. Taking these factors into consideration, it is reasonable to conclude that the supply response from outside China will be years in the making. With all that said, let's take a closer look at the supply-and-demand relationship for rare earth materials as it is currently understood. Figure 11.5 shows four relationships using data from the Industrial Minerals Company of Australia. To begin, we have rare-earth supply from China, rest of world (ROW) supply, global demand for rare earth on the top line, and finally Chinese demand on the bottom line. This figure points out two significant facts. The first is that the rate of change in global demand has been outpacing the rate of change in supply from China. The second is that the rate of change in Chinese demand has also been outpacing the growth in supply from China.

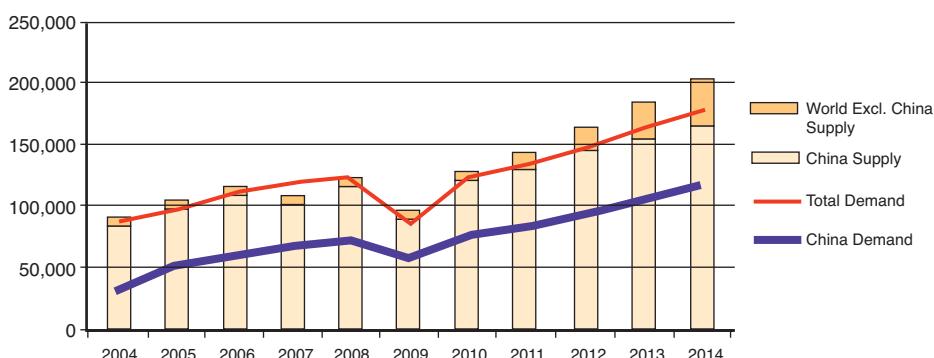


Figure 11.5 Rare-earth market supply and demand, both recent and projected

Source: Dudley Kingsnorth, IMCOA

These relationships, insofar as they persist, have important implications for the price of rare earth materials in the coming years. Global demand for rare earth materials has consistently ranged in the high single digits to low double digits since the early 2000s. Despite the approximate matching of Chinese supply to worldwide demand, with intermittent deficits and surpluses thus far, the industry will need to raise production levels in light of the increasing demand owed to the secular trend of consumption derived from green technology. As we look at expected demand levels over the next five years, meeting the world's production requirement will increasingly fall on producers from outside China. To bring these specific relationships into better focus, let us take a closer look at the expected growth dynamics in the coming years. In particular, the fastest demand growth is occurring in the metal alloys and magnets. Here consumption is expected to continue growing over the next several years in the range of 10% to 20% per year, depending on the specific product. So where does this leave potential supply and demand in the coming years? Based on what is known and available to outsiders, China's recent annual production of rare earth has been approximately 115,000 metric tons, and total global supply was 124,000 metric tons in 2008. Therefore, outside sources need to start bringing new supply onto the market to meet projected demand during the next several years or risk supply deficits. There are many potential, but unproven, sources, including a host of sites such as Mountain Pass, Calif.; Mount Weld, Australia; Dubbo, Australia; Nolans, Australia; Hoidas Lake, Canada; and India. In order for these projects and other outside sources to close the possible deficit that may appear in the coming years absent their supply, production will need to almost double from 2008 levels. This feat would meet the projected deficit and keep the market roughly balanced. Whether producers outside China can raise world production more than twofold over the coming years remains to be seen. Historically, miners often struggle bringing capacity on line as soon and as easily as expected. Even if they can, the market will still only balance out based on these projections from IMCOA. Finally, this discussion has not included the scenario of demand growth above the mid-single digit growth projections offered in the data which, based on historical levels, is closer to 8% per year in the several years leading up to 2008. If the market for rare earths entered

a supply deficit in the coming years, this would not be without precedent. During 2007, as evidenced in Figure 11.5, global demand far outstripped all the combined supply sources. As the market tightened in the procession to this event, prices in key rare earths such as neodymium skyrocketed, as shown in Figure 11.6. Technology producers had to continue buying these materials either way to continue selling their product.

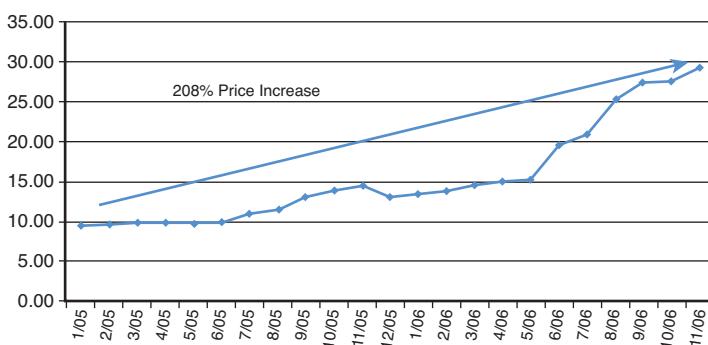


Figure 11.6 Neodymium prices in USD/KG

Source: Feller Magnets

The future always remains unknown. However, the supply-and-demand relationships we have discussed create a bullish scenario for rare earth prices, as well as for producers lying in the upstream to midstream portions of the value chain that can pass along price increases. Moreover, in accompaniment with the rising demand dynamic, China is progressing in ways that will limit the future amount of rare earth available on the world market for foreign technology companies. The United States eventually recoiled at the environmental consequences of the commercial production of rare earth. And now China is clamping down on the weaker operators in the industry and driving out the most polluting producers in an effort to better care for its environment. Indeed, the sign of a prospering country is its increasing attention to environmental matters at the expense of unchecked commercial interests. Also, as China continues to develop its economy, it is increasingly moving its own technology industry up the value chain and into higher, more sophisticated technology products. The easiest detectable by-products of this shift, and

a direct manifestation of these developments, are China's export and production quotas that have continuously restricted the availability of rare earths for export to entities outside China. This paradigm has been misconstrued by outside observers as an aggressive move to limit availability. On the other hand, it is more likely that the quotas simply underscore the changing attitudes of a progressing nation that wants to develop a key natural resource in the most economic and efficient way possible. In the coming years, China will continue to consume more of these goods internally due to its own development, which may lead to a few side effects. First, this will prompt foreign companies to move their own production to China to gain secure access to rare earths. Second, it should help advance the technology industry within China, because the country has relatively unfettered, low-cost access to these critical raw materials. In both respects, this helps China monetize the natural resource in a more constructive manner. In the first case, when foreign manufacturers bring their operations into China, this will create much-needed employment in higher-wage, value-added segments. In the second case it will provide Chinese technology firms with a competitive advantage in the sourcing of raw materials. Both cases create an enterprise-based solution to China's constant need to gainfully employ its citizens, particularly in the absence of the long-ago discarded "iron bowl" of social safety nets. Finally, since these raw materials are at the epicenter of technology innovation, in the years and decades to come China can eventually position itself at the headwaters of innovation in technology. This represents a significant opportunity for progress in China's economy and standard of living. The bottom line is that in the twenty-first century, China has a deep competitive advantage in the race toward advanced technology. Careful observers have seen some evidence of the competitive advantage the Chinese possess thanks to their cheap access to rare earths and their relentless drive to compete and innovate. For instance, a battery producer called BYD (Build Your Dreams) used its expertise to build a sedan called the E6 that reportedly gets 249 miles per charge. The Chevy Volt reportedly travels only 40 miles on one charge. This says as much as anything about what China really wants to accomplish through its control of rare earths—creating products that can compete and win in the global marketplace.

In sum, the rare-earth industry presents a growing opportunity for investors to participate in the rapid growth of technology. For starters, investors can sidestep the most glaring pitfall and risk of technology investment—the constant threat of obsolescence. No investor wants to load up on shares of the manufacturer of the Betamax VCR when the VHS VCR will be introduced a year later. Likewise, the Walkman gave way to the CD player, which gave way to the iPod. Technology is about innovation, and innovation leads to upheaval. If an investor knows, however, that many key technologies spring from the application of a few raw materials, that investor can focus on these upstream products; therefore, risks are tied less to obsolescence as he or she seeks to capitalize on the constant demand in this industry. Finally, it is difficult to overlook the potential role the Chinese will play in technology in the years to come, blessed with these competitive advantages.

Endnotes

¹ Frank A.Y. Wang. “Taiwan TFT LCD.” Morgan Stanley Research Asia Pacific, January 16, 2009.

² Koto Yuzawa. “We expect the coming hybrid era to bring earnings growth.” Goldman Sachs, May 28, 2008.

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