CHAPTER 1

Commodities and Their Current Stories

As we sit here waiting for the extreme global climate events to begin to hit Planet Earth, we realize that they are already here. The following headlines of events have already occurred, along with thousands of others:

"Floods Swamp Eastern Australia"
"Droughts in Russia"
"Repeated Blizzards Cover the Northeastern Section of the United States"
"Hurricane Devastates Southern States"
"Vancouver Breaks Record for Coldest Freeze"
"Drier-than-Normal Conditions Lead to Dozens of Fires Destroying Timberlands"
"Heavy Rains Linked to Humans in Recent Study"
"Global Change Leads to Excessive Rain, Snow, and Flooding"
"Mudslides and Floods Destroy Homes"
"Sydney Sets Heat Wave Record"

There are many cynics in the world who do not believe that global climate change is occurring. The beauty of it, from an investor's standpoint, is that it doesn't even matter because, as shown in the preceding news events, we already have ample extreme weather events that will impact the stock market (and the bond and futures markets as well). To the extent that the environmental scientists are correct and the effects of global climate change do in fact get more frequent and powerful, the number of

weather-based investment opportunities will increase significantly. Every investment idea in this book will work under today's global climate condition and will get even more lucrative if global climate change continues.

So what is the tie that binds extreme weather and financial markets? The tie that binds these two things together is commodity supply shocks. The extreme weather-based specialized definition of supply shock is one of the most critical things to understand in this entire book. It is the link between extreme weather events and the stock market. Let me explain.

Definition: Supply Shock

The temporary and sometimes permanent elimination of the supply availability of a commodity resulting primarily from a global climate shock or extreme weather event. The resultant spike in the price of the affected commodity provides opportunity for investment in multiple financial markets including primarily the stock market, the bond market and the futures market. Equivalent price spike reactions can also occur as a result of political, organizational, and major geologic events such as earthquakes.

It is also critically important to understand the extreme weather–based specialized definition of a commodity.

Definition: Commodity

Bulk goods and basic materials including metals, grains, food, minerals and energy, all derived from natural resources, which may or may not trade in the futures market. The price is subject to the forces of supply and demand. Price is particularly sensitive to supply shocks associated with extreme weather events.

It is also critically important to understand the newly created definition of *shock value*.

Definition: Shock Value

The amount of time a supply shock persists. The higher the number of days, the greater is our window of time for entry into an investment. The higher the number of days, the greater our potential holding period of the investment.

As shown in the definitions, a sudden change in the availability or "supply" of a commodity causes the price of that commodity to change. More specifically, if the supply of a material suddenly vanishes (due to an extreme weather event such as a flood in eastern Australia, which is a recent

actual event that blocked the availability of coal in the region), then the price will go higher because everyone will be fighting to get the remaining supply and will be willing to pay more for it. The big winners in this case, of course, are the remaining producers of the commodity in short supply that are not involved in the devastated region. This is because they now get to sell their product at a higher price. Higher prices mean higher profits, and higher profits mean higher stock prices.

Now that we know that commodities are such a critical part of extreme weather–based investing, it's important for us to increase our general understanding of the various types of commodities and their relative attractiveness. The attractiveness of a commodity from an investor's standpoint is referring to the current supply/demand situation for that particular commodity. Examples always help to clarify what is meant by the attractiveness of a commodity. In the first example, we talk about the impact sugar prices have on the chocolate maker Hershey; and in the second example, we talk about a retail clothing store.

If the Hershey Company desperately needs sugar to make candy bars but sugar has suddenly become unavailable because of recent heavy flooding, the people at Hershey start to get very nervous because without the sugar they will not be selling any candy bars. The *fear* that Hershey feels causes them to increase the price they are willing to pay for sugar because if they do not get the sugar, it will be very costly to them when they stop selling their product. This is bad for Hershey because they are buying sugar, but it is a *jackpot* for the sugar makers because the price of sugar is going up. So, a sugar shortage results in decreased profits for Hershey and increased profits for sugar makers.

Another classic example is retail clothing excess inventory after the holidays have come to an end. In this case, the store desperately wants to get rid of the excess inventory to make room for the new season and the new fashions. Meanwhile, the holidays are already over and no one is buying. This combination of too much supply and a shrinking demand is a *big problem* for the retailer because the price of the clothing will need to go much, much lower to make the product sell. These two examples can be captured in the generalized supply/demand table shown in Figure 1.1. As shown in the table, when supplies are limited and demand is strong, this is the best possible combination for any commodity and is considered a jackpot, thus allowing the profits of the commodity producer to rise.

Similarly, when supplies are high and demand is relatively weak, this is a big problem for any commodity because the price of that commodity is going to fall hard, thus causing the profits for the makers of that commodity to drop. The remaining two possible combinations are considered *neutral* because supply and demand are both going in the same direction.

	Lots of Supply Coming	Very Little Supply Coming
Demand Growing	Neutral	Jackpot
Demand Shrinking	Big Problem	Neutral

FIGURE 1.1 Commodity Categories

For example, it is acceptable if supplies are growing as long as demand is growing, too; and it is acceptable if demand is shrinking as long as the supply side is staying stable to declining.

The exciting part about commodities is that the vast majority of them fall into either the Jackpot or Neutral category and very few fall into the Big Problem category. We will get into more detail shortly, but for now we will simply list the major commodities and categorize them into the quadrants shown in the table.

Jackpot

- Copper
- Corn
- Wheat
- Soybeans
- Orange juice
- Fertilizers
- Metallurgical coal
- Iron ore
- Oil
- Sugar
- Cocoa beans
- Cotton
- Coffee
- Silver
- Gold
- Platinum
- Palladium
- Rare earths
- Potash

Neutral

- Zinc
- Aluminum
- Steel
- Nickel
- Lead
- Thermal coal
- Soda ash

Big Problem

- Natural gas

Limited Opportunity

- Lean hogs
- Live cattle

Granted, commodities are cyclical and their status changes over time, but their current cycle is very sticky, meaning that global demand for commodities in general is growing (over the long haul) and simultaneously it is getting harder and harder to find a good, quality supply of these materials. This combination means the outlook for commodities over the long haul is generally good. Now, what happens when a particular commodity over the next 10 years happens to move from the Jackpot category to the Big Problem category? Does that destroy our investment opportunities we talk about in this book? No, absolutely not. Regardless of where a commodity falls in the four categories, it will still respond quite favorably (i.e., price of the commodity will go up and therefore the profits for the commodity maker will go up, and hence the stock price of the commodity maker will go up) in the event of a supply shock associated with global climate change. Nevertheless, I include a discussion on the supply/demand status of each commodity to help the reader understand these materials even better. In addition, even though supply shocks from global climate change will help any commodity, it is particularly juicy from an investing standpoint if it falls within the Jackpot category.

JACKPOT COMMODITIES

Now we will go into some more detail on the story behind each of the major commodities, starting with the Jackpot commodities.

Copper

Copper has among the healthiest fundamental outlooks for commodity materials. The supply/demand balance for copper remains tight despite the fact that the United States residential and nonresidential construction markets remain soft but at least are finally nearing the bottom.

Figure 1.2 shows the end-market usage for copper. As the demand for copper in China continues to grow and as construction demand in the United States rebounds, the demand side of copper will become increasingly attractive.

Despite very strong demand in China for copper, copper mine concentrations are not in China, thus greatly helping the supply-side story. Remember, there are a lot of people in China who need jobs. If copper mining were geologically abundant in China, the decision to add jobs by adding mining capacity would occur, but instead this is not a problem for this commodity. Another supply-side dynamic that is favorable to copper is the decreasing quality of the copper ore coming out of the mines. So, in many cases around the world, despite increasing rock movement in the mines, less copper is produced from the prior year, thus continuing to exacerbate an already tight supply/demand balance, thus putting copper squarely into the Jackpot category.

The global climate shock–type investment opportunities for copper reside in the stock market, the bond market, and the futures market, and to a much lesser extent in the currency market, as we will cover in more detail later.

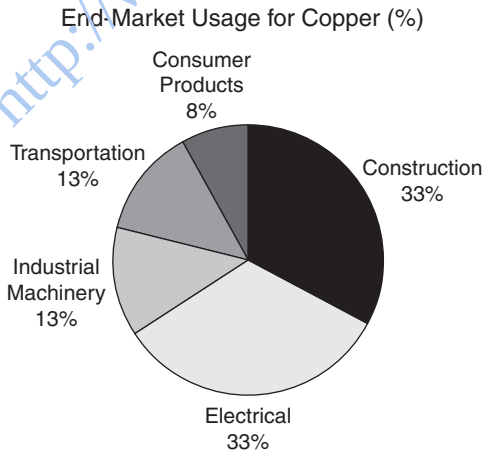

FIGURE 1.2 End-Market Usage for Copper
Source: Freeport McMoRan public filings, 2010.

Corn

Corn, like copper, has both a favorable demand-side story and a favorable supply-side story, thus again putting it squarely into the Jackpot category. On the demand side, global population growth guarantees the need for more food (see Figure 1.3 for the demand uses for corn).

Food is a nondiscretionary purchase. However, the increasing demand for food gets turbocharged when looking at what's happening in emerging regions such as China. As the population in China gets wealthier, they tend to migrate from eating strictly grain to instead incorporating beef, chicken, and pork. It takes approximately eight pounds of grain to make one pound of beef. It is this shifting dynamic in food consumption that provides the exponential upward slope in the demand curve. In addition, within the United States, the decision has already been made to add up to 15 percent ethanol to the gasoline pool. Ethanol is derived from corn. The need to convert corn into ethanol to satisfy demand in the gasoline market puts even more demand pressure onto corn. So the demand side of the corn analysis is obviously a home run.

On the supply side, the story also looks good. Within the United States, the opportunity to increase the available acres of farmland for growing corn in the United States is very limited. The United States represents a whopping 41 percent of global corn production. Even on a global scale, Brazil is among the few places in the world where incremental farmland acres are available. The tight supply and strongly growing demand for corn makes corn a very attractive commodity in general, but importantly it also meets the key criteria for making it susceptible to global climate shocks. Specifically, it is produced in highly concentrated regions of the world (i.e.,

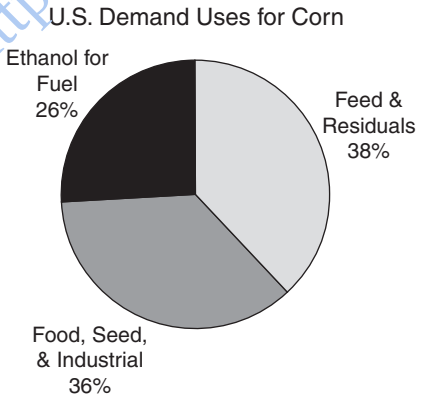

FIGURE 1.3 U.S. Demand Uses for Corn
Source: USDA, 2009.

the United States produces 41 percent of the global total) and therefore if the Corn Belt within the United States sees widespread drought or flooding conditions, then the price of corn will increase significantly, thus providing us plenty of investment opportunities.

As will be shown, the primary weather-based investment opportunity in corn lies in the futures market. There are also indirect investment opportunities related to corn in the stock market and corporate bond market.

Wheat

The story behind wheat is similar to that of corn in terms of the nondiscretionary demand for food globally. In fact, it is second only to rice as the main human food crop and still ahead of corn. As global population grows, so, too, does the demand for wheat consumption (see Figure 1.4 for the domestic demand uses for wheat).

On the supply side, wheat is more diversified globally in production as compared with corn. Nevertheless, the geographic concentration of production is high enough to still allow the price of wheat to spike in the event of a global climate shock in a particular wheat-producing region of the world. The classic example was the severe drought in Russia in the summer of 2010. Although Russia represents only 9 percent of the global production of wheat, it was still a large enough quantity to drive up wheat prices. The bottom line for wheat is that the combination of a healthy demand side along with limited acreage on the supply side places wheat into the Jackpot category.

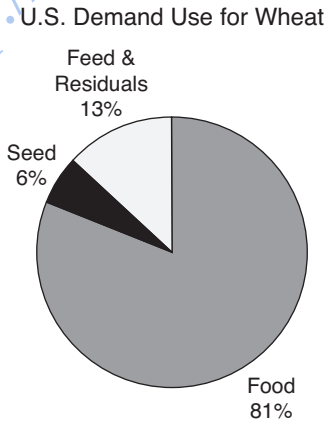

FIGURE 1.4 U.S. Demand Use for Wheat
Source: USDA, 2010.

The primary weather-based investment opportunity in wheat lies in the futures market.

Soybeans

The story behind soybeans is similar to that of corn in terms of the nondiscretionary demand for food globally. Therefore, there is generally a positive correlation between the demand for soybeans globally and global population. The link to population growth enables a healthy demand-side outlook for soybeans. However, the link to population growth is actually better than it appears. As we talked about in the corn section, the most exciting demand driver for soybeans is related to the migration of the daily diet of people in the emerging markets, such as China, toward higher protein intake in the form of beef, chicken, and pork as opposed to the historically traditional grain-based diets. As we talked about in the corn section, eight pounds of grains such as soybeans are required to produce only one pound of beef. This is a very powerful positive on the demand side for soybeans (see Figure 1.5 for the demand uses for soybeans).

On the supply side, soybeans have an exciting story, too. Their global, geographic concentration of production is high, meaning there are only a few geographies in the world where soybeans are made as well as a limited quantity of acres within each geography. This is very favorable because it lends itself to global climate shock–type investing. In other words, when a region of the world that produces soybeans is racked with severe drought or severe flooding, the price of soybeans goes up and

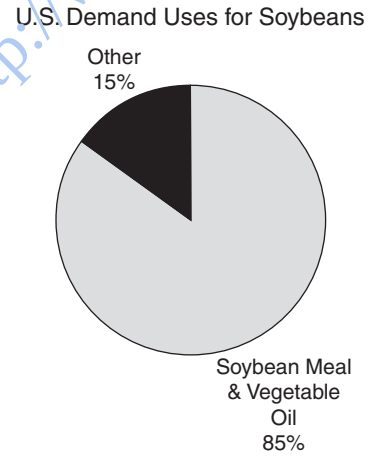

FIGURE 1.5 U.S. Demand Uses for Soybeans
Source: USDA, 2010.

therefore represents an opportunity for us (we will cover this in more detail later).

Another interesting dynamic that occurs on the supply side is farm acreage rotation between corn and soybeans, for example. When it comes time for springtime planting, the farmer has some choices to make. Using this example, the farmer must choose between corn and soybeans to plant on his available acreage. The decision on which one to plant depends on multiple factors. One key factor is the price of corn versus the price of soybeans. If the ratio of the price of soybeans to corn is very low, then it makes sense for the farmer to plant corn because he will maximize his profits by selling more corn instead of the relatively low-priced soybeans. In addition to the economic decision behind planting corn versus soybeans, the farmer also has other considerations, including, for example, the desire to rotate the crops to help get rid of certain pests in the soil that may attack soybeans more than corn. He also may rotate the crops to optimize the nutrients in the soil. Corn, for example, absorbs more nitrogen fertilizer than does soybeans partly because of the ability of soybeans to receive some of its nitrogen requirements directly from the nitrogen in the air. By rotating the crops the farmer optimizes his economics as well as technical aspects of the soil. However, by rotating the crops, the farmer impacts the supply availability of soybeans to the rest of the world. If, for example, in one particular spring, it makes sense for farmers to make more corn than soybeans, then soybeans may be in a shortage at harvest time. The bottom line for soybeans is that the existing demand- and supply-side stories puts soybeans squarely into the Jackpot category in Figure 1.1.

As we will cover in more detail later, the primary weather-based, direct investment opportunity in soybeans rests in the futures market (as opposed to the stock, bond, or currency markets).

Orange Juice

The orange juice story is generally quite healthy and we are not just talking health benefits here. On the demand side globally, consumption of oranges and orange juice is growing in alignment with population growth but also with the general interest in the health benefits of this fruit.

However, it's the supply side that makes the orange juice story particularly attractive. Florida, California, and Brazil combined produce a very large percentage of the oranges in the world. One might ask why there is such a limited geography in the production of oranges. A big part of the reason rests with the stringent growing conditions that must be present to grow oranges successfully. Oranges do best when grown in climates that have air temperatures in the 60 to 85 degree Fahrenheit range, thus limiting possible production locations globally. Interestingly, oranges are

particularly sensitive to frost conditions. Under frost conditions, the farmer often has to resort to using portable heater pots in proximity to the orange crop and also, ironically, to spraying the crop with water, which keeps the temperature slightly above freezing.

The healthy demand and very limited supply-side stories for orange juice place this commodity into the Jackpot category.

As we will see, the extreme weather–based investment opportunity for orange juice rests within the futures market.

Fertilizers

Recall from the earlier discussion on corn that the amount of acreage available for the production of corn is quite limited. So what is a farmer to do if he wants to increase the amount of corn he produces each year? The farmer has no choice but to increase the amount of bushels per existing acre of farmland with the use of fertilizer. So, in other words, the bullish demand outlook for corn cascades down into the fertilizer space. All three of the major fertilizer types, including potash, phosphates, and nitrogen-based fertilizers, are in high demand because of the farmer's desire to increase his crop yields (bushels per acre of corn) in order to keep up with the ever-growing demand for corn.

What about the supply side of fertilizers? The short answer is that for all three primary types of fertilizer there is very limited supply coming on stream over the next few years. Without getting into too much detail, each of the three fertilizer types has its own particular reason why supply is limited. Briefly, for the mineral potash, the supply is limited because of the very limited number of global players in possession of the high-quality potash rock, the best of which is located in Saskatchewan, Canada (see separate section on potash rock).

As far as the phosphate fertilizers are concerned, the same basic story holds, with a very limited number of global players in control of the highest-quality phosphate rock.

Within the nitrogen fertilizer space, the capacity is limited by access to cheap natural gas, which is the primary raw material needed to manufacture nitrogen-based fertilizers. This limit is gradually going away, however, with the relatively recent discovery of excess natural gas supplies.

Another factor that it is important, with respect to limiting the available global fertilizer capacity, is the massive amount of money and time required to build additional mining and production capacity.

The bottom line for fertilizer is that the strong demand and the short supply put fertilizers into the Jackpot category.

The opportunities for investing in the fertilizer space are in the stock market and the corporate bond market, as we will see later in the book.

Metallurgical "Met" Coal (aka Coking Coal)

Metallurgical coal is another great story. Most coal in the world is used in the production of electricity. Metallurgical coal is special coal in the sense that it is better in terms of carbon content, lower impurities, and lower volatile material. This very high quality coal is not used to make electricity. It is mostly used in the production of steel, as shown in Figure 1.6.

Technically speaking, this coal must be specially prepared before it is used in the production of steel. For those interested in a bit of technology, this coal must first be heated in an inert atmosphere (inert means basically no oxygen allowed when baking this coal because the oxygen would react with the coal and make our coal turn into a gas and disappear from the baking oven—not exactly the best way to sell coal). After baking, we get a more stable and pure form of coal now known as "coke" at this stage of the production. This coke is used in steel-making blast furnaces. The coke reacts with iron ore in the blast furnace, producing iron metal, which is later converted into steel (steel is nothing more than iron plus a little carbon addition). So, technology aside, the key point here is that as the demand for steel grows globally, so, too, does the demand for metallurgical coal. Most groups around the world see global steel production growing at about 4 to 6 percent per year. This translates into similar levels of growth for "met" coal, thus making the demand side of the equation for "met" coal very attractive.

On the supply side, there are only a limited number of geographies that contain this high-grade coking coal, including eastern Australia, western Canada, and the eastern United States. Other regions of the world have the

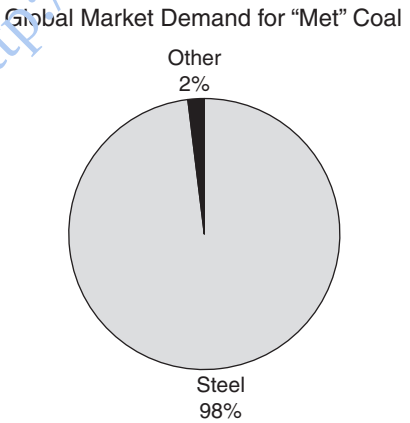

FIGURE 1.6 Global Market Demand for "Met" Coal
Source: Teck Resources public filing, 2009.

material but the quality is not as good, thus helping to limit the high-quality supply.

With demand strong and high-quality supply limited, this points to solid fundamentals for met coal and also puts met coal into the Jackpot category.

As we will see later in the book, weather-based investment opportunities in the met coal sector include the stock market and the corporate bond market. Opportunities to invest in met coal in the futures market and the foreign exchange market are essentially nonexistent.

Iron Ore

The story of iron ore is nearly identical to the story of coking coal. The three primary raw materials used to produce steel from scratch in a blast furnace (i.e., as opposed to simply remelting scrap steel in something called a "mini-mill") are iron ore, coke (aka processed met coal), and limestone. The iron ore is the key source of iron metal in the production of steel. Similar to metallurgical coal, the greatest demand driver for iron ore is also steel, as shown in Figure 1.7.

So, similar to metallurgical coal, as the global production of steel grows, the demand for iron ore grows correspondingly. Looking forward, global steel production will continue to grow at the rate of 4 to 6 percent per year, according to most public estimates. This is very good news for producers of iron ore.

On the supply side, it is difficult to find very high quality iron ore. In fact, there are only a few locations in the world with very high quality iron

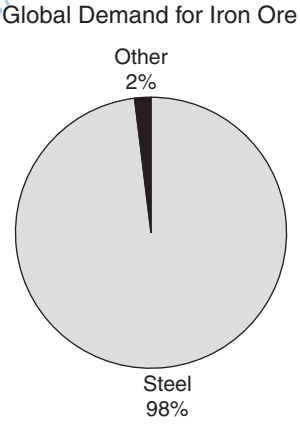

FIGURE 1.7 Global Demand for Iron Ore
Source: USGS, 2010.

ore, including Brazil and western Australia, for example. China has lots of iron ore but of the lower-quality type, hence the need to import this material into China. Thus, the supply side of the iron ore analysis also is generally quite favorable. New capacity in the western Australian region is a couple of years out into the future still.

The strong demand for iron ore in combination with limited supply makes the fundamentals of this material quite attractive and, in fact, quite similar to the metallurgical coal story, thus again putting this material into the Jackpot category.

As will be shown, the extreme weather–based investment opportunities in the iron ore space reside in the stock market and the corporate bond market. Opportunities to invest in iron ore within the futures market or within the foreign exchange market are largely nonexistent.

Oil

The global demand for oil—and every other energy source, for that matter—is projected to grow, according to the 2010 Energy Information Administration's (EIA) world energy report. Oil demand in particular is expected to grow by 1.4 percent per year globally. See Figure 1.8 to compare the demand growth of oil with other fuel types.

The positive demand growth story is also supported by the global emergence from the recession trough, which occurred in early 2009.

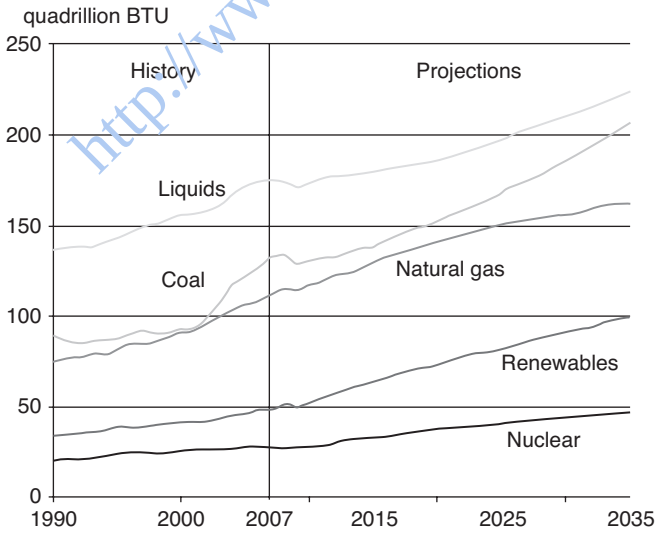

FIGURE 1.8 World Marketed Energy Use by Fuel Type
Source: EIA public filing, 2010.

On the supply side, it is getting harder and harder to find easy-access oil. The oil that we do find is either more costly and/or dirtier than the oil of the past, and it is generally found in deeper and deeper locations with higher and higher levels of sulfur content. In addition, on the supply side, the global oil market is plagued with politically driven global supply shocks.

Once again, the combination of growing global demand and tight supply leads to strong fundamentals for the oil commodity, thus again putting it into the Jackpot category.

Investment opportunities within the oil commodity reside in the futures market, the stock market, and the bond market.

Sugar

As emerging regions of the world continue to migrate toward a Western diet filled with processed food, soft drinks, and other confectionary delights, the global demand for sugar will continue to grow. Most foreign and domestic government sources point to global growth in the 2 percent per year range.

On the supply side of the sugar analysis, we see that sugar meets the extreme weather–based investing criteria of global, geographic concentration. In other words, a few select regions of the world hold a disproportionately high level of global sugar production. This is important because in the event of a global climate shock in the key sugar-producing regions of the world, we will see sugar prices climb rapidly.

The growing demand and favorable supply-side situation for sugar places sugar into the Jackpot category in Figure 1.1.

The weather-based investment opportunities in the sugar commodity lie mostly within the futures market. There are also a few select opportunities within the stock market, as will be explained later.

Cocoa

Cocoa is the key ingredient in the production of chocolate. The positive, global demand growth for chocolate is the result of population growth as well as the increased per-capita consumption of chocolate in emerging economies as the average income in these regions rises. "Emerging" regions of the world refer to places such as China, Russia, India, Brazil, and some areas of eastern Europe. Currently, mature regions such as Switzerland, Europe, and North America have the highest per-capita consumption of chocolate.

On the supply side, commodities do not get much more attractive than cocoa in terms of its very high geographic concentration. As will be discussed in much more detail later, western Africa dominates the production

of the cocoa bean. There was a time when the Brazilian region was a much larger part of the global production of the cocoa bean. However, the crop disease known as Witch's Broom significantly lowered the crop yield in this area of the world. For this reason, and also because of cheaper labor costs, the western African region dominates cocoa bean production today.

The growing global demand and the favorable supply-side dynamic within the cocoa bean commodity places cocoa into the Jackpot category.

Weather-based investment opportunities in the cocoa bean reside predominantly within the futures market. There are also a few opportunities within the stock market as will be discussed later.

Cotton

Although most people are most familiar with cotton as a fiber used in the production of apparel, its end-use market split is actually a bit broader. The pie chart in Figure 1.9 shows the primary end-use markets for cotton.

The key demand driver for cotton is China. China drives demand for many commodities given its very high gross domestic product (GDP) in combination with its very low per-capita consumption of virtually every material. They consume 40 percent of the global demand for cotton. Despite the positive demand growth for cotton, there is some substitution risk from man-made fibers, including polyesters, as well as from other natural fibers, including wood fibers. Nevertheless, the global demand remains positive.

On the supply side, cotton has a fairly impressive level of geographic concentration of production. This is a prerequisite for effective global climate shock–type investing, as discussed repeatedly. Among the leaders in

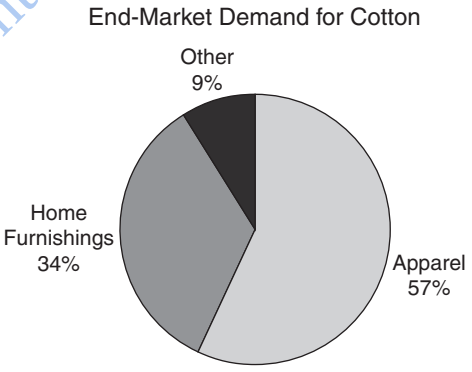

FIGURE 1.9 End-Market Demand for Cotton
Source: Cotton.org, 2010.

the production of cotton is China, with 29 percent of global cotton production (more on this later). The fact that China consumes more than it makes translates into healthy imports into China for this commodity.

The combination of globally healthy demand and a geographically concentrated supply puts cotton into the Jackpot category.

Weather-based investment opportunities with cotton reside predominantly within the futures market. Opportunities within the stock market, the corporate bond market, and the foreign exchange market are quite limited.

Coffee

Globally, the consumption of coffee is quite mature. The compounded annual growth rate shown in Figure 1.10 is 1.5 percent. Population growth and higher incomes contribute to demand growth but the mature regions already have fairly saturated per-capita consumption rates. Nevertheless, the demand curve remains slightly positive on a long-term best-fit basis, as shown in Figure 1.10.

On the supply side, coffee has the desirable geographic concentration in production, which lends itself to global climate shock–type investing. We will cover the supply side in more detail later.

The combination of a rugged but mature demand curve and the geographically concentrated supply side puts coffee into the Jackpot category.

Weather-based investment opportunities in coffee reside exclusively in the futures market. More on this later.

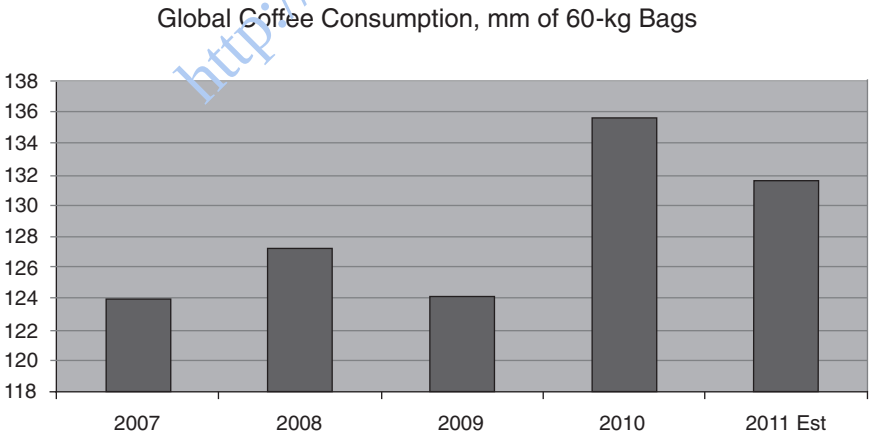

FIGURE 1.10 Global Coffee Consumption
Source: USDA, 2010.

Silver

The key end markets for silver are shown in Figure 1.11. As shown, the end-market demand is quite diversified and, in fact, mirrors GDP more so than it mirrors jewelry consumption, as one might expect. Aside from the secular decline occurring in digital conversion in the photography end market, the demand is growing overall, particularly after recovering from the declines in the global recession.

On the supply side, silver is produced as a by-product of lead/zinc/gold production, representing 70 percent of total mined product, and the balance comes from primary or "on purpose" silver mining production. If we include old silver scrap in the supply mix, then scrap holds 20 percent of global supply in 2010. Silver has a fairly concentrated geographic mix in terms of production quantity, thus making it fairly attractive for its extreme weather–based investment opportunities.

Given the very strong global demand and the fairly concentrated global geographic supply, silver gets placed into the Jackpot commodity category.

Extreme weather–based investment opportunities lay in the futures market predominantly with some additional opportunities in the stock market as well. More on this later.

Gold

Unlike silver, jewelry is the predominant demand driver for gold, as shown in Figure 1.12. Jewelry drives 89 percent of demand for gold.

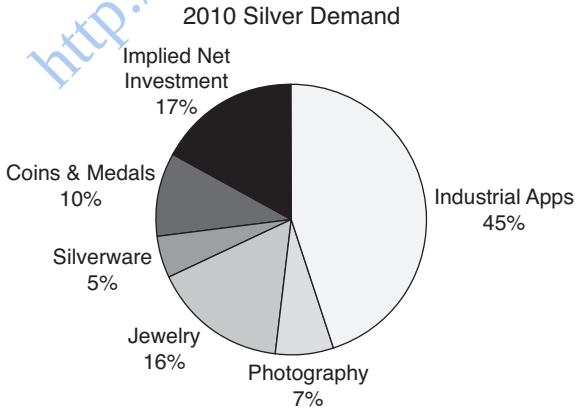

FIGURE 1.11 2010 Silver Demand
Source: Silverinstitute.org, 2010.

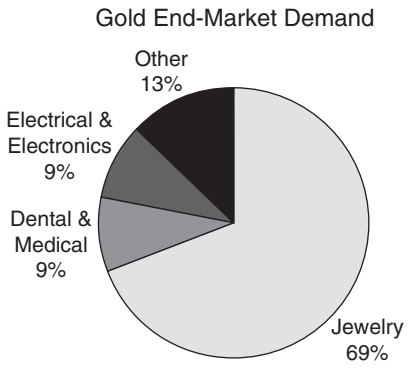

FIGURE 1.12 Gold End-Market Demand
Source: USGS, 2010.

The improving economics for individuals in emerging nations, including India and China, are helping drive the increase in demand for jewelry. Gold gets the double positive whammy in that not only is the functional demand for gold growing but gold also acts as a safe economic haven commodity. The countercyclical nature of gold allows the demand for gold to increase when the economy seems shaky and also when the value of the U.S. dollar gets weaker. Evidence of the strength in the gold commodity is glaringly obvious when looking at the price of gold over the past decade. Relative to the price in other commodities, the price of gold did not decline nearly as much during the global recession beginning in the fourth quarter of 2008. In fact, the price of gold is up 360 percent since 2002.

On the supply side, there are also constraints in terms of locating high-quality, high-yielding mining assets. The combination of the positive demand-side factors with the fairly tight supply side puts gold into the Jackpot category.

Interestingly, however, when evaluating gold from the standpoint of an extreme weather–based investment, it becomes much more challenging. Yes, it meets criterion number one of a favorable supply/demand outlook; however, it is challenged in terms of the second requirement of geographic concentration. Global gold production split out geographically is shown in Table 1.1.

The challenge for gold is that despite having 9 percent of its global production in the United States, the mining assets within the United States are geographically diverse. Therefore, an extreme weather event would have to hit a very large portion of the United States simultaneously. This makes gold much less attractive than corn, for example, given that 41 percent of global corn production comes from the United States, and even within the

TABLE 1.1 World Gold Production

World Gold Production	Percent Split
China	14%
Australia	10%
United States	9%
Russia	8%
South Africa	8%
Peru	7%
Indonesia	5%
Canada	4%
Uzbekistan	4%
Brazil	3%
Mexico	2%
Papua New Guinea	2%
Chile	2%
Other	21%
Total	**100%**

Source: USGS, 2010.

United States, the Midwest Corn Belt drives the lion's share of that total, thus making corn a very good investment opportunity from the standpoint of extreme weather–based climate stocks. We therefore will not spend a great deal of time on gold for extreme weather–based investing. Remember again, the purpose of this book is to identify investment opportunities in the context of extreme weather–based investing. Therefore, although gold may be a great investment in general due to its "jackpot"-type characteristics, it is not terribly attractive from the standpoint of an extreme weather–based investor.

Platinum

Platinum is a member of the platinum group metals (PGMs). The PGM group includes platinum, palladium, rhodium, ruthenium, and iridium. Platinum has a very exciting story for the extreme weather–based investor. First, let's take a look at the demand side. Globally, the key demand drivers for platinum are outlined in Figure 1.13.

As shown, the key drivers for platinum are auto catalysts and jewelry. Auto catalysts are used in the vehicle emission system. Their job is to reduce noxious emissions into the atmosphere. The key demand driver for catalysts is the global auto build rate, which is growing even in the United States currently, but more so in China. The demand for jewelry is also growing globally, in line with rising income levels, particularly in the

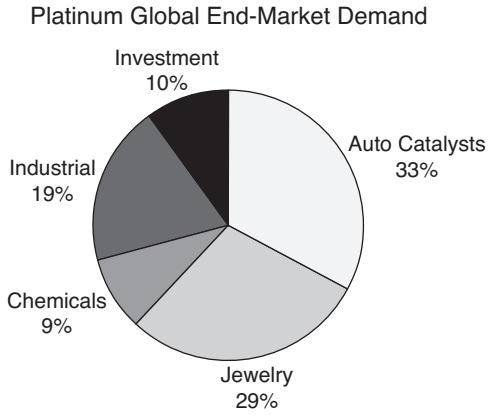

FIGURE 1.13 Platinum Global End-Market Demand
Source: Johnson Matthey public filings, 2010.

emerging regions of the world. On a geographic basis, the demand split is shown in Figure 1.14.

Two surprising pieces of information come out of the geographic demand split pie chart. First, the demand for catalysts is very high in Japan. This follows from the strong global position held by the Japanese automakers. Second, China also holds a very large portion of the global demand for platinum. This is impressive considering that the primary mode of transportation in China just two decades ago was the bicycle. Chinese demand for both cars and jewelry is growing strongly as income levels continue to

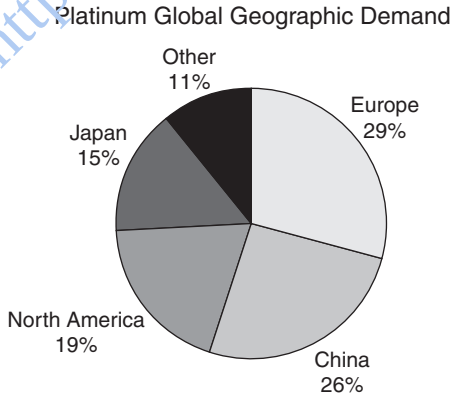

FIGURE 1.14 Platinum Global Geographic Demand
Source: Johnson Matthey public filings, 2010.

rise in this emerging region. Overall, the demand story for platinum is quite healthy, despite the demand-side interruption that occurred as a result of the monstrous Japanese earthquake in 2011.

On the supply side, things get even more exciting. Platinum has one of the most concentrated geographic sources of production of all commodities. This characteristic is critical for an extreme weather–based investor. As a reminder, we like very high geographic concentration in a commodity. In fact, the higher the level of geographic concentration, the better. This is true because in the event of a major global climate shock, which impacts a critical supply region for a particular commodity, the price of that commodity will rise. The higher the geographic concentration, the higher the price will rise. In addition, the longer the duration of the extreme weather event and the higher the impact on the supply availability of the commodity, the higher and longer the price will continue to rise.

Overall, given a healthy demand and a very consolidated supply, platinum gets placed into the Jackpot category.

We will cover platinum in much more detail in the chapter covering global climate shocks affecting mines. Extreme weather–based investment opportunities exist for platinum in the stock market, the futures market, and the exchange-traded fund (ETF) market. This commodity ranks among the highest in terms of its extreme weather–based investing attractiveness and opportunities.

Palladium

Palladium is also within the PGM series. Geologically, all of the PGMs are often found together. This is the reason that the producers of platinum are also the producers of palladium almost exclusively. Despite the similar geologic characteristics, palladium has a slightly different end-market demand split. Figure 1.15 shows the global end-market demand split for the metal palladium.

As shown, the demand for auto catalysts is the key driver for palladium. In fact, because palladium is cheaper than platinum on a per-ounce basis, palladium has taken market share away from platinum. Despite the shift in market share, the demand for both metals in the auto catalyst application is still growing.

By contrast, the jewelry end market favors platinum over palladium at this time. Outside of the differences in the auto and jewelry end markets, these two metals have similar demand drivers. The geographic end market demand for palladium is shown in Figure 1.16.

Similar to the global geographic demand split for platinum, aside from the developed regions of the world in North America and Europe, the other two key geographies are Japan and China. Japan is critical because of the

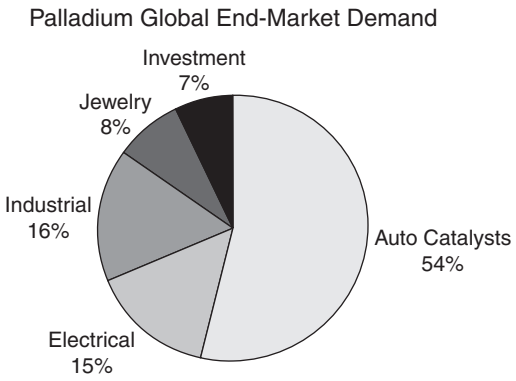

FIGURE 1.15 Palladium Global End-Market Demand
Source: Johnson Matthey public filings, 2010.

excellent global position held by the Japanese automakers. Palladium auto catalyst demand obviously correlates with the auto build rate. China is critical as the strongest global demand driver not only for palladium but for the vast majority of commodities in general. Interestingly, even within the developed regions of the world, palladium demand growth is solid not only because of the car build rate but also because of the increasingly challenging auto emission standards and the consequent need for auto catalysts. So, in general, the demand story is very good for palladium.

The supply side for palladium, like the supply side for platinum, is downright exciting for the extreme weather–based investor. It possesses the very desirable, highly concentrated global production characteristics

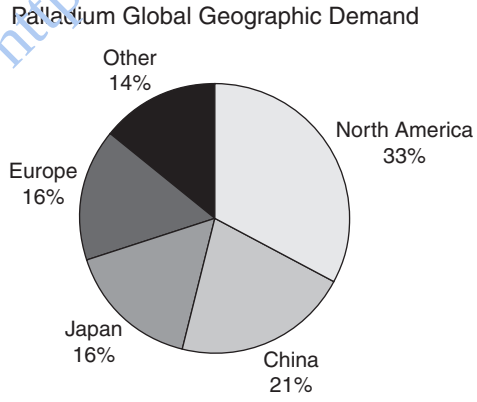

FIGURE 1.16 Palladium Global Geographic Demand
Source: Johnson Matthey public filings, 2010.

we seek as an extreme weather–based investor. The combination of a healthy demand story and a healthy supply-side story puts palladium into the Jackpot category.

We will cover the supply side and the specific investment opportunities in great detail in the chapter covering mine-based global climate shocks. The palladium-based investment opportunities we will cover include opportunities within the stock market, the futures market, and the ETF market.

Rare Earth Elements

The rare earth elements are typically defined as all of the elements in the periodic table that fall under the heading of the "lanthanoids" plus scandium and yttrium. These elements are shown in Table 1.2.

The rare earth elements are very unique in their supply/demand story. On the demand side, as shown in Figure 1.17, we see a globally growing and diverse set of applications.

On the supply side, which we will cover in more detail in the chapter covering mine-based global climate shocks, these materials are quite restricted currently. China is the dominant player and has instituted a severe curtailment on exports of rare earths. Their monopoly power is allowing

TABLE 1.2 Rare Earth Elements

Rare Earth Elements	Chemical Symbol
Scandium	Sc
Yttrium	Y
Lanthanum	La
Cerium	Ce
Praseodymium	Pr
Neodymium	Nd
Promethium	Pm
Samarium	Sm
Europium	Eu
Gadolinium	Gd
Terbium	Tb
Dysprosium	Dy
Holmium	Ho
Erbium	Er
Thulium	Tm
Ytterbium	Yb
Lutetium	Lu

Source: Periodic Table of the Elements.

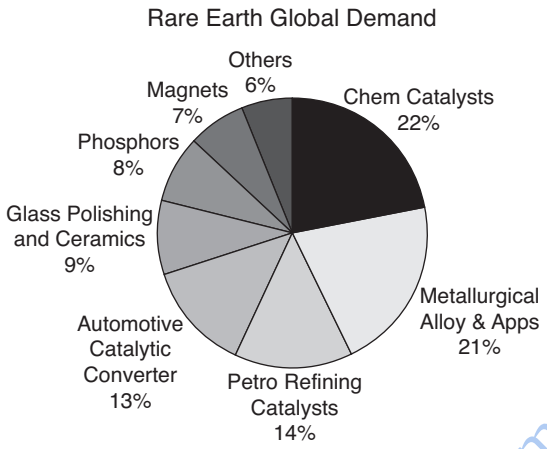

FIGURE 1.17 Rare Earth Global Demand
Source: USGS, 2010.

them to create a politically induced supply shock, thus keeping the rare earth market quite tight. The combination of a growing global demand but a tight supply story puts rare earths directly into the Jackpot category at this time.

As we will see in the chapter covering mine-based global climate shocks, there are investment opportunities in rare earths in the stock market and in the ETF market. Extreme weather–based investment opportunities within the corporate bond market and the foreign exchange market are generally nonexistent with regard to rare earths.

Potash Rock

Potash the rock and potash the downstream fertilizer share the same exciting end-market demand story (see the story for corn earlier in the chapter for additional detail). The end-market demand for potash rock is shown in Figure 1.18.

On the supply side, the potash source rock has a solid story. Not only is there a limited number of high-quality, low-cost sources of potash rock globally, but any new capacity additions are large and expensive, take a long time, and are quite visible. With limited capacity additions on the way, and with strong demand, potash falls into the Jackpot category. We will cover the supply side in more detail later.

As an extreme weather–based investor, there are numerous ways to invest in potash. We not only cover potash fertilizer investing in the chapter on "Global Climate Shock Number 3: Farmland Droughts, Floods, and

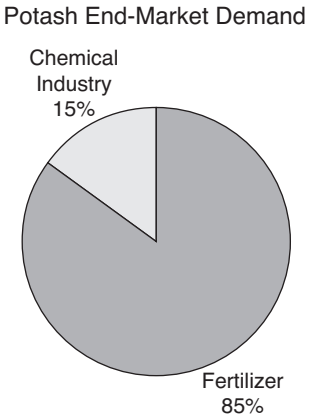

FIGURE 1.18 Potash End-Market Demand
Source: USGS, 2010.

Frost," but we also cover it in the chapter on "Global Climate Shock Number Two: Flooding Mines." In general, the investment opportunities are within the stock market and the corporate bond market. The nutrient potash does not trade in the futures market, nor are there any opportunities in the currency markets related to potash. On a related note, however, there are opportunities within the futures market for corn, as will be covered in detail.

NEUTRAL COMMODITIES

Zinc

Zinc ranks fourth in terms of world global metal production behind iron, aluminum, and copper. The end-market demand drivers for zinc are shown in Figure 1.19.

Globally, the demand for zinc is growing generally in line with GDP. This is an attractive feature of zinc.

The healthy demand curve for zinc, however, is partially negated by the supply-side story. Contrasting zinc with copper, for example, for which there are relatively few locations in the world with high-quality reserves, zinc is relatively more abundant, including 29 percent of global production coming out of the Chinese region, as shown in Table 1.3.

The heavy geographic concentration of zinc coming from the Chinese region is a negative attribute of this commodity. Do not confuse this with

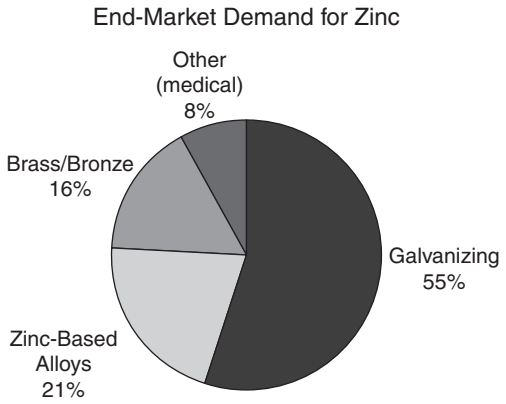

FIGURE 1.19 End-Market Demand for Zinc
Source: USGS, 2010.

the demand side. We love the fact that China has excellent and growing demand for zinc. However, we do not generally like it when a massive quantity of global supply comes from the Chinese region primarily because the incentive for increased employment for the very large population compels the government to continue to add capacity, even though it may not be the lowest cost capacity in the world. This tends to lead to overabundance of supply and relatively weak commodity pricing.

In terms of its attractiveness as a commodity for extreme weather–based investing, it generally falls short on multiple levels. As we

TABLE 1.3 Global Zinc Production

Global Production of Zinc	Percent Split
China	29%
Peru	13%
Ausi	12%
India	6%
United States	6%
Canada	6%
Mexico	5%
Kazakhstan	4%
Bolivia	4%
Ireland	3%
Other	12%
Total	**100%**

Source: USGS, 2010.

just talked about, despite the fact that demand is growing for the product globally, it is lacking in attractiveness on the supply side given its Chinese-based concentration and the potential for oversupply. This negative supply-side picture puts zinc into the "neutral" commodity box. This by itself does not necessarily negate extreme weather–based investment opportunities; however, the fact that there are very few "pure play" zinc producers (meaning all they produce is zinc) causes a zinc supply shock to be largely diluted and negated. We therefore do not spend much time on zinc as a primary target of extreme weather–based investing. There is, however, one company worth mentioning that would benefit from a supply shock–induced price spike in zinc, and that is India-based Vedanta (stock ticker VED LN). Zinc holds 21 percent of their total revenue and 55 percent of their operating income, according to recent Vedanta filings.

As you will see, aluminum metal production and steel production also share the same supply-side weakness as zinc, thus driving all three of them into the Neutral category.

Aluminum

Aluminum is derived from bauxite ore. It takes four tons of bauxite ore to make two tons of aluminum oxide via the "Bayer process" in a refinery. It further takes two tons of aluminum oxide to make one ton of aluminum metal in a smelter.

Aluminum metal has very desirable characteristics primarily related to its strength-to-weight ratio relative to other heavier materials such as steel. Its light weight characteristics allow it to take market share from other materials in the transportation sector where light weighting is important in order to conserve energy. Lighter cars, for example, get better gas mileage than heavier cars. This fact, in combination with rapid demand growth in the emerging regions of the world, make the demand side of aluminum look very attractive. The other key demand drivers for aluminum are shown in Figure 1.20.

The supply side of aluminum metal production partially negates the strong demand story. Approximately 40 percent of aluminum smelter production takes place in China. Similarly, China consumes approximately 40 percent of total global demand for aluminum. Given the very strong local demand for aluminum, China naturally wants to build aluminum production capacity to help satisfy local demand but also to increase the employment rate among its vast quantity of people. Very often, when China is at the helm in terms of being the leader in global capacity additions, the result is very often global oversupply. This negative supply-side dynamic pushes the aluminum metal commodity into the Neutral category. This is also the case with steel and zinc.

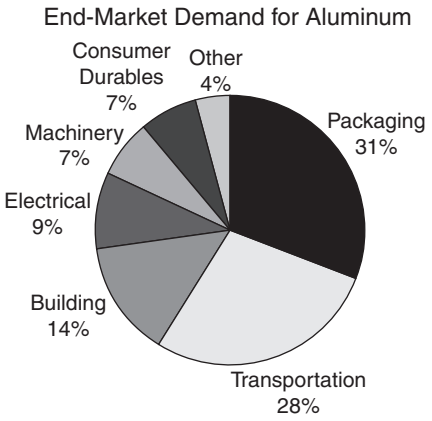

FIGURE 1.20 End-Market Demand for Aluminum
Source: USGS, 2010.

Despite the weaker supply-side story relative to its peers such as copper, there are still some extreme weather–based investing opportunities in the aluminum commodity, particularly within the futures market, but with the potential for some additional opportunities within the stock market and bond markets. Extreme weather–based investing opportunities within the foreign exchange market are nonexistent relative to this commodity. The specific investment opportunities will be covered in detail later.

Steel

Steel is a remarkable material in the sense that is represents the vast majority of global metal usage on a tonnage basis and yet it is far cheaper than other metals. Steel is used in structural applications, as shown in Figure 1.21, where its very high strength properties are required. The demand side of the supply/demand picture for steel is quite robust. Despite the weakness in demand that is occurring in the United States for steel, particularly within the nonresidential construction markets, the demand picture globally is quite strong as a result of the growth in the emerging regions of the world. Global steel demand runs at the rate of about 4 to 6 percent per year, according to figures cited at the U.S. Geologic Survey (USGS) web site, with China consuming roughly half of the total. So the demand side of steel looks very good, particularly when you consider that the United States currently is still in trough demand conditions and really just represents additional upside potential in global demand.

On the supply side of steel, China is also the dominant player, as shown in Table 1.4.

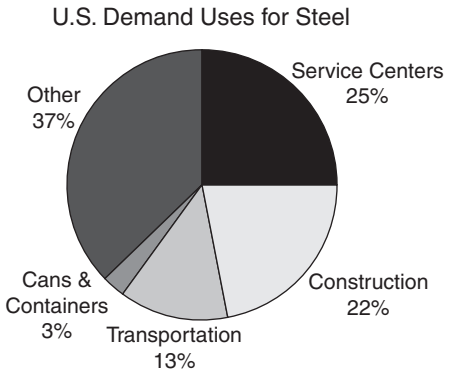

FIGURE 1.21 U.S. Demand Uses for Steel
Source: USGS, 2010.

Interestingly, steel, aluminum, and zinc all share a similar supply-side story, with China being the major global producer. Of course, China has a voracious appetite for all of these commodities, and therefore China is adding capacity in these products to help keep up with demand, but they also need to help their vast quantity of people stay employed. They have historically added capacity despite being a high-cost producer. This supply-side risk places steel into the Neutral category along with aluminum and zinc despite very healthy global demand.

TABLE 1.4 Global Raw Steel Production

Global Raw Steel Production	Percent Split
China	45%
Japan	8%
United States	6%
India	5%
Russia	5%
Korea	4%
Germany	3%
Brazil	2%
Ukraine	2%
France	1%
United Kingdom	1%
Other	18%
Total	**100%**

Source: USGS, 2010.

In terms of extreme weather–based investing opportunities in steel, unfortunately, there are very few for a couple of key reasons. Steel is not a mined product; it is a manufactured product derived from the combination of iron ore, coke (derived from metallurgical coal), and limestone. Therefore, the climate-based supply shock opportunities actually rest much more with the input raw materials rather than the steel itself because iron ore and metallurgical coal are both mined products.

What appears to be an excellent geographic concentration with Chinese-based steel production is actually quite fragmented, with dozens of steel makers scattered across the country, thus reducing the potential for a meaningful climate-based supply shock.

What about the steel futures contract? Even this path is not our most compelling weather-based investment opportunity. Earlier, we said that the key inputs to steel (i.e., iron ore and metallurgical coal) are more likely than steel itself to see a global climate shock because the key inputs are mined materials. So if we think that we should buy a steel futures contract in the event of a global climate shock in one of the two key steel-making raw materials, we are assuming that the cost increase of the raw material will eventually get passed through to steel prices, and therefore the futures contract investment would be successful. However, there tends to be a chronic oversupply in the global steel market due in part to the reasons mentioned earlier. When a market is oversupplied, the market tends to lose its pricing power and therefore may have some trouble increasing the price of steel sufficiently. If steel prices have trouble rising, then the futures contract investment would also struggle, thus making our opportunity in steel quite limited. Let's just say that more compelling opportunities exist elsewhere.

Nickel

A key end use for nickel is in the production of stainless steel because of the anticorrosion properties it imparts to the steel. This feature gets translated down into its key end-market demand drivers, which are shown in Figure 1.22.

On a global basis, the demand for nickel is quite healthy and is diversified enough such that it tends to grow with GDP globally.

On the supply side, nickel has experienced new capacity additions and is currently running at near decade-long highs in global supply of inventory. However, nickel meets our criteria for concentrated global geologic production and therefore will have opportunity in extreme weather–based investing. Given the weak supply and healthy demand backdrop, nickel falls into the Neutral category.

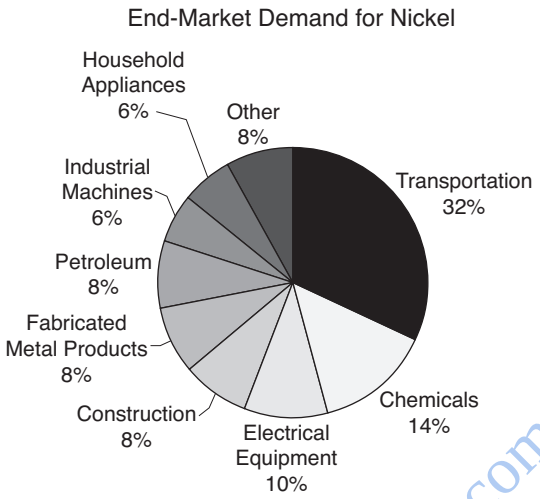

FIGURE 1.22 End-Market Demand for Nickel
Source: USGS, 2010.

Nickel has extreme weather–based investing opportunities in the futures market and a few select opportunities in the global stock market. We will discuss these opportunities in more detail in the chapter covering flooded mines.

Lead

Lead is an amazing material. It is functionally very versatile and effective and has the potential to be used in many diverse applications. However, its negative health effects offset its goodness. For this reason it has been outlawed in many applications, particularly in the United States, in such areas as leaded gasoline, paint, and piping, among others. Within the United States, the dominant application for lead is in the lead acid battery, which is the type of battery used in cars. The U.S.-based demand drivers are shown in Figure 1.23.

The fact that lead acid batteries are a key demand driver is good news globally because the global auto build rate, particularly in China, is very strong. However, the combination of the declining demand in many other global applications and the longer-term potential threat for lithium-based batteries taking share from lead acid batteries pushes the global demand picture for lead into the Neutral category.

On the supply side, lead is mined globally, with China producing by far the largest portion of the global total. Table 1.5 shows the global split-out in terms of global lead mining production.

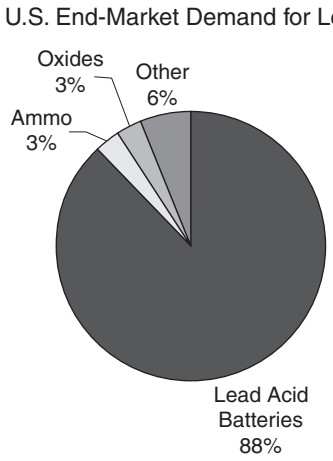

FIGURE 1.23 U.S. End-Market Demand for Lead
Source: USGS, 2010.

The supply side of lead suffers from the same situation we saw for steel, aluminum, and zinc in terms of its exposure to Chinese-based capacity additions. In addition to the Chinese supply-side exposure, lead also has an additional negative on the supply side. This metal has a remarkably high rate of successful recycling. Within the United States, the secondary

TABLE 1.5 Global Lead Production

Global Lead Production	Percent Split
China	43%
Australia	15%
United States	10%
Peru	7%
Mexico	5%
India	2%
Russia	2%
Bolivia	2%
Canada	2%
Sweden	2%
South Africa	1%
Ireland	1%
Poland	1%
Other	7%
Total	**100%**

Source: USGS, 2010.

supply (i.e., from scrap lead remelted) provided for 82 percent of total U.S. consumption of lead, according to the USGS. This is fairly easy to envision given that virtually every car battery gets recycled within the United States.

The combination of the mediocre global supply/demand situation puts lead into the category of Neutral.

When it comes to extreme weather–based investing, lead does not have the characteristics we like. Specifically, we will not keep lead a primary focus of extreme weather–based investing for the following reasons:

- Lead has a heavy concentration of its supply-side mining exposure to China, which has repeatedly been shown to contribute to overcapacity.
- The fact that a very meaningful portion of the supply side of lead comes from a secondary source (i.e., scrap recycled lead) does not lend itself to global climate shocks because the scrap material is not mined but, rather, derived from other sources such as from old car batteries.
- The number of public companies with lead as a major portion of their total revenue is quite limited, and therefore extreme weather–based opportunities in the stock market in this metal are quite limited.
- Lead does trade in the futures market, but other commodities present better opportunities, so for our purposes we will avoid this metal.

Thermal Coal

The global demand for thermal coal is growing. The end-market driver for thermal coal is almost exclusively for the production of electricity. With GDP in both China and India growing at very healthy rates, this implies the need for continued growth in the power-generation space, and, in fact, coal-based power generators are being constructed in China and India currently. The recent earthquake in Japan and its very negative impact on the nuclear power generators' reputation, contributes to increased growth in coal-based power plants. There are also substitution threats from other power sources, including natural gas, hydroelectric, wind, and solar, but given the very abundant coal reserves globally, including those found in China and the United States, coal will continue to play a very important role for the foreseeable future, including the expectation for positive global growth.

On the supply side, relative to metallurgical coal, thermal coal is one step less impressive. In the case of metallurgical coal, the regions of the

world where one can find very high quality metallurgical coal are very limited and, in fact, are limited to three major regions, including the eastern United States, western Canada, and eastern Australia. Thermal coal, by contrast, has a wider distribution of fairly high quality material. It therefore gets put into the Neutral category, whereas metallurgical coal stays in the Jackpot category.

Because of the wider distribution of supply-side availability in thermal coal relative to metallurgical coal, we will keep our focus on metallurgical coal when it comes to identifying extreme weather–based investing opportunities.

As we will discuss in great detail, the extreme weather–based investing opportunities in metallurgical coal reside within the stock market and the corporate bond market. Opportunities within the futures market and the foreign exchange market are essentially nonexistent.

Soda Ash

Soda ash is a key ingredient in the production of glass. The most prevalent type of glass is what is known as soda-lime-silica glass. The *soda* refers to soda ash. Soda ash is also used for the production of detergent and other chemical uses, but glass is the dominant end market, as shown in Figure 1.24.

Globally, the demand for soda ash is a slightly positive number, in the 1 to 2 percent range despite the persistent weakness in the construction market in the United States. The construction market uses glass, which is the key end-market driver for soda ash.

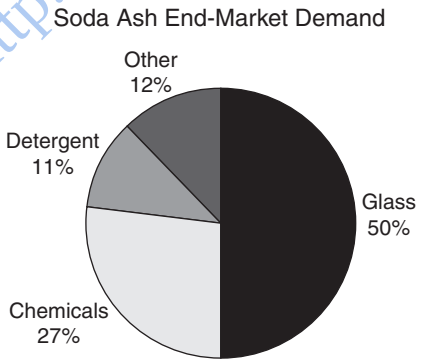

FIGURE 1.24 Soda Ash End-Market Demand
Source: USGS, 2010.

The supply side of soda ash is even more interesting. Generally speaking, there are two dominant ways to produce soda ash. It can be produced from natural trona rock or via a synthetic method. Table 1.6 shows the production split globally for soda ash.

The vast majority of the global, naturally mined production of soda ash comes from Green River, Wyoming. In this single mining complex, four major producers operate, the most important of which, from a public investing standpoint, is the FMC Corporation (stock ticker FMC). The "natural" method of production is the low-cost method globally. However, the low cost is referring to the cost of production at the mine. Unfortunately for the Wyoming producers, they export a large percentage of their soda ash, which roughly doubles their costs because they are so distant from the Asian region that receives much of their product, thus putting the synthetic soda ash makers in China right in line with the Wyoming producers on a delivered-cost basis.

Synthetic soda ash, by contrast, is made from salt and limestone, both of which are in abundant supply. The process is energy intensive as well, thus contributing toward its higher cost position relative to the natural soda ash at the mine.

China is the largest producer and consumer of soda ash. As a result of their desire to satisfy local demand, the relative availability of raw materials, and the desire to keep their vast population employed, there tends to be overcapacity in the region.

Given the mediocre global demand growth, in combination with the tendency for overbuilding of capacity, soda ash falls into the Neutral category.

From the standpoint of an extreme weather–based investor, the number of opportunities is fairly limited in soda ash. On the surface, it appears very promising because of the massive concentration of natural soda ash in Green River, Wyoming. In the event of an extreme weather occurrence at this mining complex, it indeed would represent a major supply shock to

TABLE 1.6 Global Soda Ash Production

Global Production of Soda Ash	Percent Split
Natural, United States (mostly Green River, WY)	22%
Synthetic	75%
Other	3%
Total	**100%**

Source: USGS, 2010.

the global soda ash balance; however, it would directly, negatively impact the major public producer of soda ash in that region, FMC Corporation. So, in the case of FMC Corporation, the guidance is simply to avoid this stock in the event of an extreme weather occurrence in Green River, Wyoming. Even when considering the eight major producers of soda ash in China, we cannot make money on them because the industry is state run. To further confound the problem, soda ash does not trade in the futures market and also offers no opportunities within the foreign exchange markets. The bottom-line guidance in soda ash for the extreme weather–based investor is avoiding FMC Corporation when an extreme weather event hits Green River, Wyoming.

BIG PROBLEM COMMODITIES

As shown earlier, most commodities fall into the category of Jackpot or at least Neutral in terms of their supply/demand fundamental outlook. One good example of a commodity that currently deviates from this trend is natural gas in North America. Although the demand side for natural gas has been and will continue to be generally mature but positive, the supply side has experienced a dramatic increase in the availability of natural gas in North America. Historically, the industry, when drilling for natural gas deposits in North America, has always drilled vertical holes. However, this creative industry decided to try drilling horizontally while hydro-fracturing the surrounding stone. This seemingly simple switch allowed the industry to generate a massive quantity of new supply of natural gas for years to come. Figure 1.25 shows the location of the major new supply, known for its geologic descriptor, "shale plays."

Figure 1.26 shows the location of the more traditional sources of supply within what is known as the "tight gas plays."

This massive new supply is obviously bad news for the natural gas producers because it has put downward pressure on the price of natural gas.

From the standpoint of an extreme weather–based investor, despite the fact that natural gas falls into the Big Problem commodity list, there are still some opportunities, particularly in relation to hurricanes in the United States. We will talk about this in detail in the chapter covering extreme hurricane events. Specifically, there are investment opportunities within the stock market, the bond market, and the futures market. We also cover real-life examples and results in the natural gas space in Chapter 8, "Real-Life Examples: Execution, Results, and Timing."

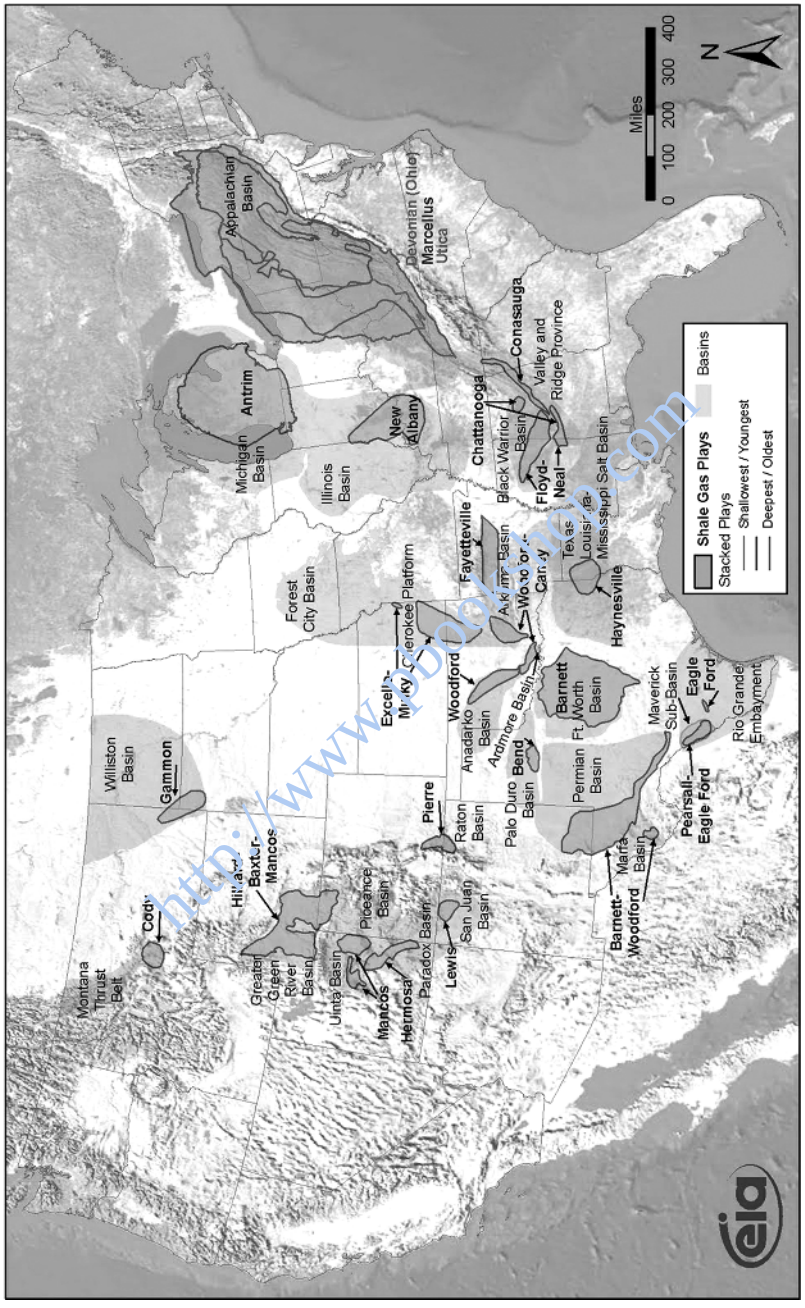

FIGURE 1.25 Shale Gas Plays
Source: EIA, 2009.

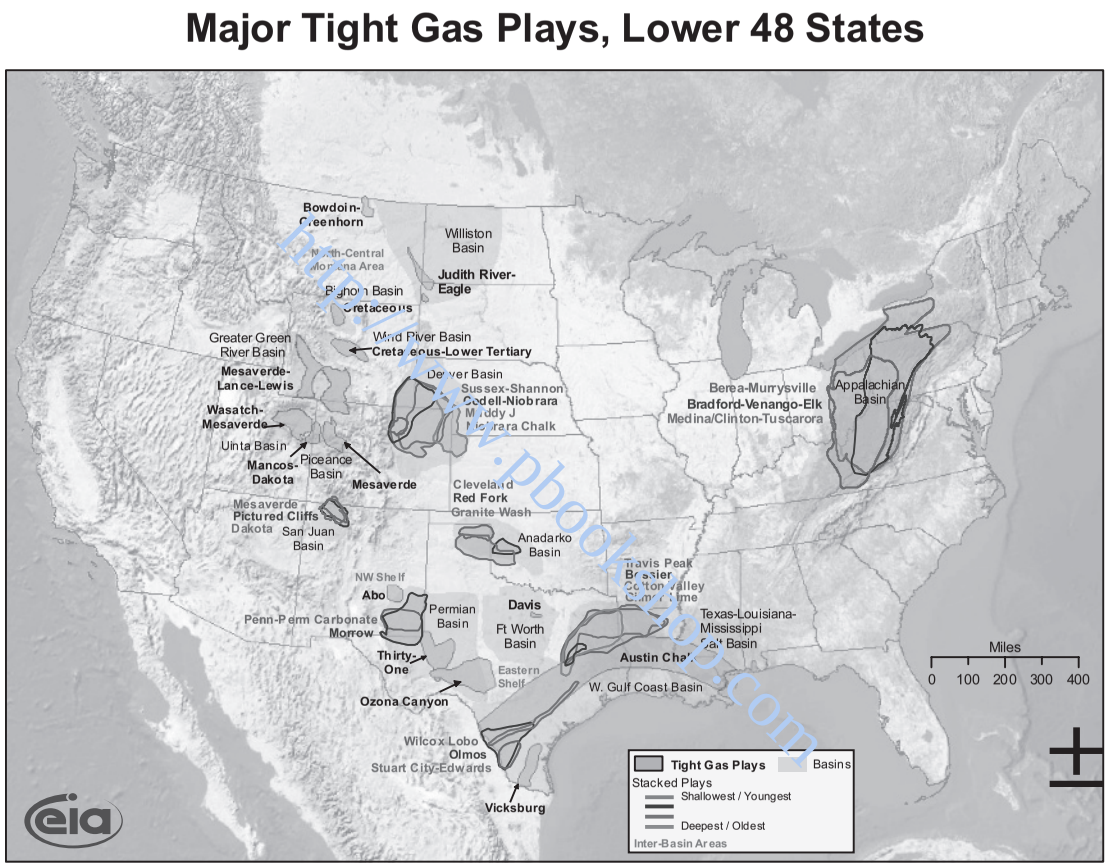

FIGURE 1.26 Major Tight Gas Plays
Source: EIA, 2009.

OTHER LIMITED OPPORTUNITY COMMODITIES

When considering investment opportunities associated with global climate shocks, a key aspect of the analysis is the likelihood of a meaningful supply-side disruption. In the next section we consider lean hogs and live cattle.

Lean Hogs and Live Cattle

When considering whether lean hogs or live cattle could have a meaningful supply-side disruption based on the weather, it appears unlikely and therefore negates meaningful opportunities for extreme weather–based investing. Granted, it is true that supply shock can and will occur in meat-producing operations, but this is more often related to disease and not the weather.

Another indirect investing opportunity within the meat-producing industries is related to a supply shock in the price of corn. A supply shock in the price of corn increases the cost of feeding the hogs and cattle, but this is a second-tier effect, which is far better exploited by investing in corn futures directly.