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WHITE PAPER

Turning up the H.E.A.T. *Investing in Global Healthcare, Environment, and Agriculture Trends*

by

Santtu Seppälä

Introduction

Two years ago we introduced the acronym Global H.E.A.T. (Healthcare, Environment, and Agriculture Trends) to describe a unique investment opportunity set. Since then, we have received a lot of investor and reader feedback about its merits. Our own conviction in the space dates back seven years and continues to grow as new investing themes emerge and evolve. But we frequently get asked about the advantages of focusing on these areas. This White Paper discusses the trends we see happening over the next three, five, ten years and beyond. We describe the backdrop and what gets us excited about the changes taking place. We argue that now is a historically opportune time to get involved. We offer examples of how the trends translate into specific investment opportunities within the long / short equity space and explain why they can be helpful in delivering positive differentiated returns. Finally, we discuss the growing synergies linking Healthcare, the Environment, and Agriculture.

The Trends

Healthcare

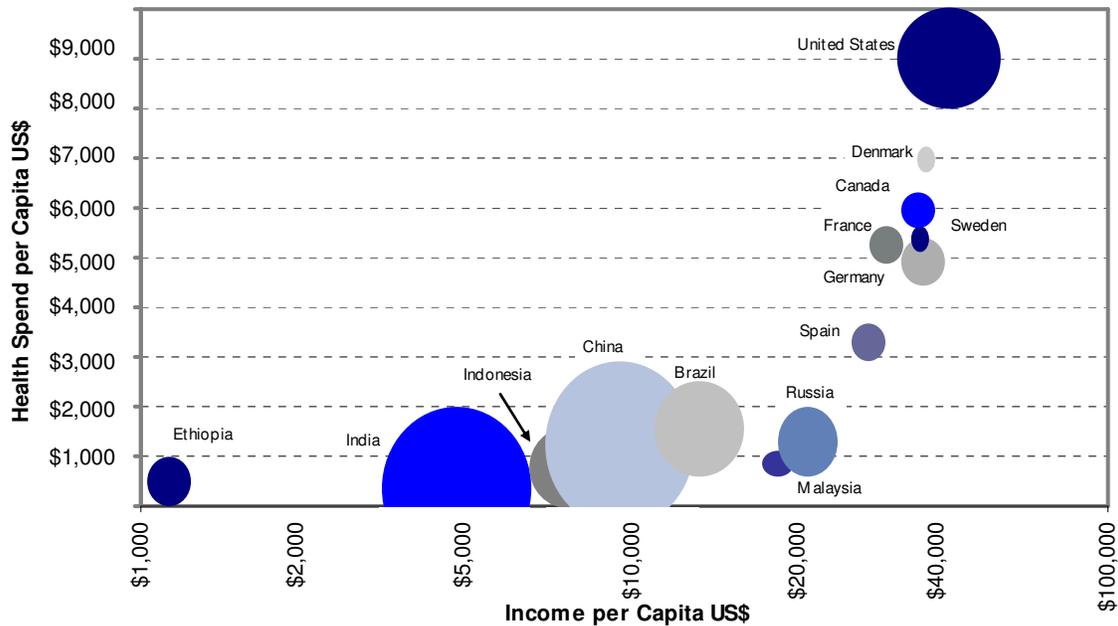
- ***4.5BN people in developing markets will spend more on healthcare***
- ***Aging OECD populations need more medical resources***
- ***U.S. healthcare spend as a % of GDP is unsustainable***
- ***Drug research is entering a new frontier of discoveries and cures***

Before discussing the drivers in Global H.E.A.T., it's important to define what we mean by Healthcare, the Environment and Agriculture. In all three areas, we use the broadest descriptions possible. Healthcare is perhaps the most obvious. It includes all trends impacting the health and well being of people around the world. This holistic definition extends even to industries that are harmful to consumers' health, such as tobacco. Importantly, and by design, it offers an extensive opportunity set that supports investing flexibility.

To appreciate the changes unfolding in Healthcare, we divide the world into developing and developed markets. Each is undergoing unique but distinctly different trends. The developing market is made up of roughly 4.5 billion people that will grow to 5.3 billion by 2050. It currently has low healthcare spending per capita but fast-rising incomes that portends tremendous potential in the years ahead. Rising incomes correlate strongly with increased life expectancy. They also correlate with total healthcare spending. As half the world's population sets out on the path towards economic parity with the developed world, we will

witness a period of radical transformation. In 2013 China spent \$367 per person on healthcare annually. India only spent \$61. The U.S., by contrast, spent \$9,146.

Healthcare Spend versus Personal Income 2010



Source: Rosling, Hans (2015). www.gapminder.com and World Health Organization Global Health Expenditure Database.

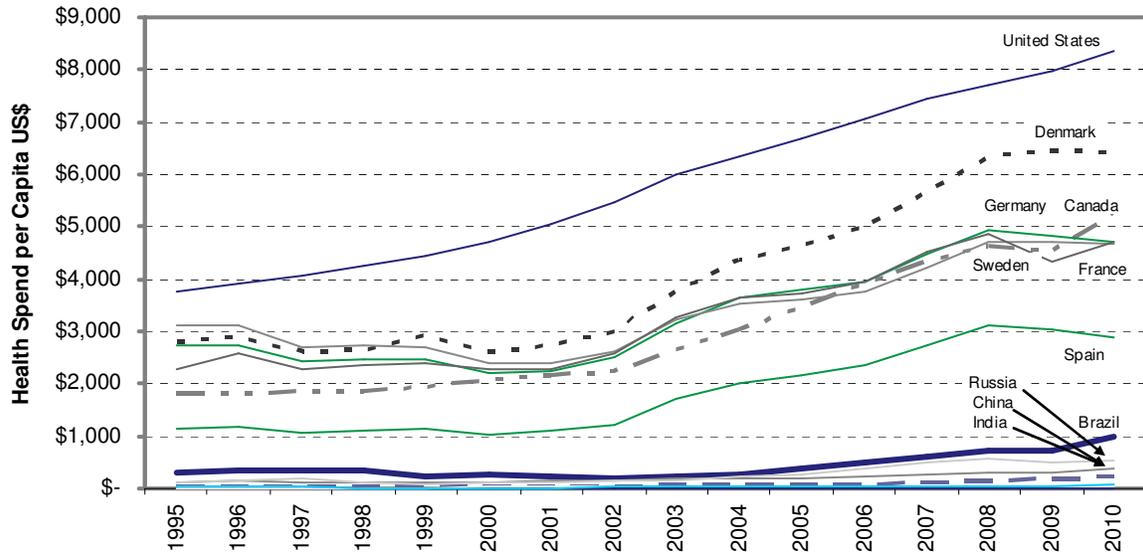
The convergence to developed world income levels and healthcare spend won't happen overnight. However, an important point in the chart above is that income is depicted on a logarithmic scale. As income goes up, health spend can eventually double and triple quickly – witness countries such as Canada and Denmark relative to Spain and Russia. China and India, with their large population sizes shown using large circles, will dictate most developing market trends. Markets in Russia, Indonesia, Malaysia, Brazil and the Middle East, to name a few, will also be important. Even if these countries never reach U.S. levels of health spending, there is still room for dramatic growth.

As the developing market transitions, longer life expectancy and better insurance coverage also change the mix of healthcare spending. By and large all developing healthcare markets see their healthcare dollars migrate over from fighting infectious diseases to treating advanced economy diseases. Topping the list of these rich country diseases are high blood pressure, coronary heart disease, type 2 diabetes, cancer, mental health, osteoporosis, and asthma. These ailments carry much higher treatment price tags. Admission into the developed healthcare market spending paradigm is hard to avoid as a result. Individual country spending varies of course with medical needs. In China, for example, approximately one third of all adults smoke cigarettes, resulting in 1 million direct and 100,000 second-hand smoke deaths every year. The lost GDP and cost of treating the cancers and heart disease attendant with this smoking is already enormous and will only get bigger until smoking rates come down.

How much countries spend on healthcare as a % of GDP is a leading challenge in the developed world. A simple definition for the developed market is membership in OECD. In contrast to the developing market, the developed one is made up of only 1.3 billion people. Despite its small size, it accounts for 84% of the \$7 trillion spent globally on healthcare in 2010. The biggest spender in the group is the U.S. at 17.1% of GDP. This high level of spending is economically unsustainable. As the chart below shows, the amount spent per capita doubled between 1995 and 2010. Such high spending eats into overall GDP growth, productivity, and U.S. competitiveness. If left unchecked, it has the potential to literally bankrupt the country's healthcare system. Many of the trends endemic to the U.S. are also present in other OECD nations such as Denmark, Canada, Germany, France, and Sweden (see chart below). Not surprisingly, their governments are focused on trying to lower the cost of healthcare – by limiting insurance coverage,

raising patient co-pays, establishing drug price controls, performing more testing to catch conditions earlier, and encouraging preventative medicine to reduce incidence of disease.

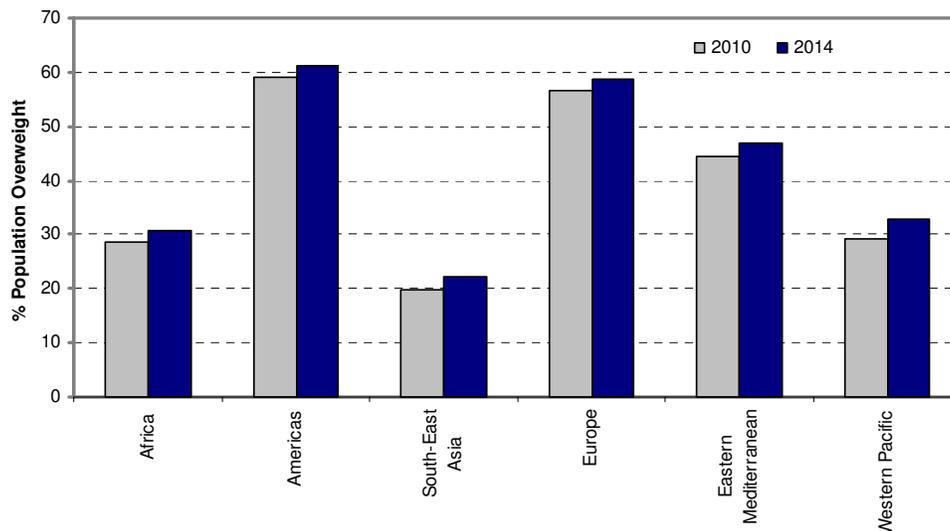
Healthcare Spend Over Time



Source: Rosling, Hans (2015). www.gapminder.com and World Health Organization Global Health Expenditure Database. Inflation adjusted.

Two issues make it difficult to reign in costs in the decades ahead. The first is demographics. Across the OECD, the share of older (+65 years old) to younger (15 – 64 year-olds) adults will more than double by 2050. It puts an enormous strain on a healthcare system's finances when fewer young tax payers are available to pay for entitlements promised to older citizens. Consider the magnitude of the costs for just one disease state – Alzheimer's. Direct costs of the disease are estimated to rise five-fold, from \$172BN in 2010 to \$1.1TN in 2050. The second issue has to do with the health of populations. Sedentary lifestyles and unbalanced diets have led to high obesity rates, raising total healthcare costs. The chart below shows the prevalence of obesity by region and the growth between 2010 and 2014. In 2014, almost 2 billion adults worldwide were overweight. Six hundred million of them were obese. All of which is to say, despite intense efforts to keep a lid on costs, the next 10 – 15 years will see increased levels of spending.

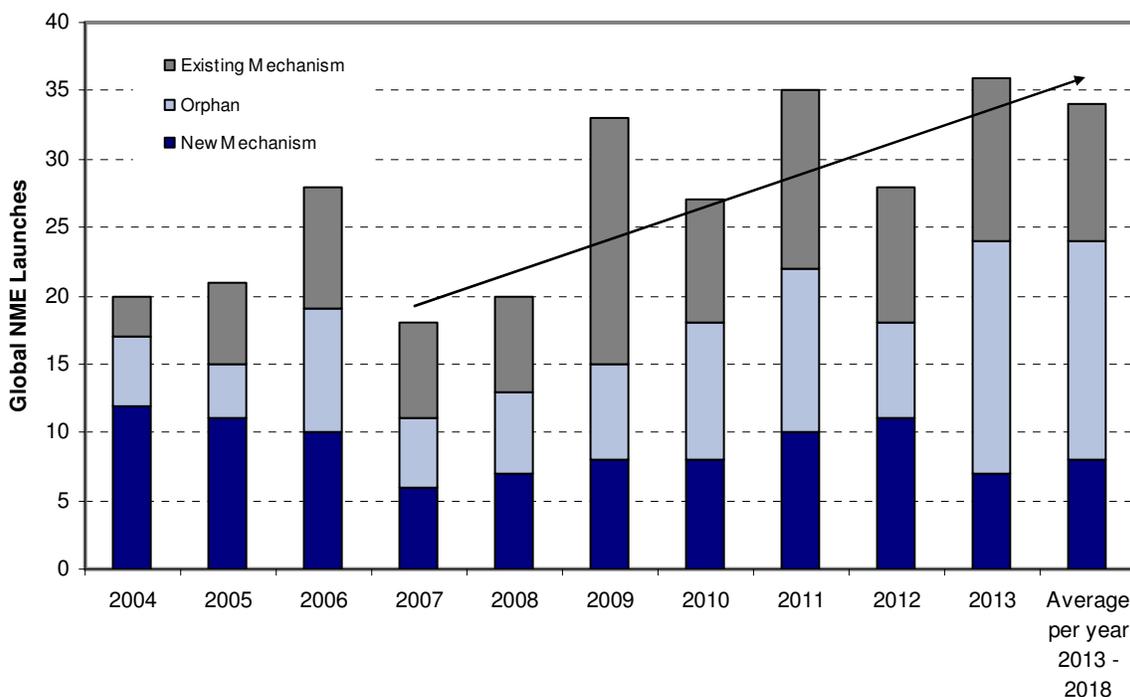
Overweight Prevalence by Region



Source: World Health Organization. Overweight defined as BMI >= 25. Age group +18 years.

The good news for developed markets is that advances in drug development and treatments are accelerating. The genomics revolution that began two decades ago is finally bearing fruit. There are fewer drug development failures in early stage clinical trials thanks to novel targeted approaches. Beyond just better R&D efficiency, the total number of drug candidates in pipelines is hitting all-time highs.

Global Launches of New Molecular Entities (NMEs)



Source: IMS Institute for Healthcare Informatics, October 2014.

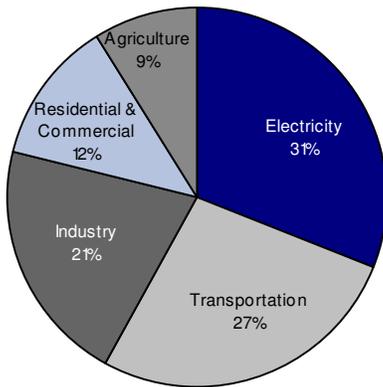
The above chart shows the steady rise in orphan and new mechanism molecular entity launches during the past ten years. On the pipeline side, new records are being broken on many measurement levels: total number of new molecular entities (NMEs) in development, potential first-in-class medicines, medicines targeting diseases for which there have been no recently approved therapies, drugs that incorporate a “personalized medicine” approach or that apply a new scientific strategy. An innovation revolution is clearly underway. The initial beneficiary is the developed market. One example of a recent breakthrough occurred in 2014 with the introduction of a new treatment for Hepatitis C. Gilead Sciences’ anti-viral drug Sofosbuvir was approved and dramatically improved outcomes for patients with cure rates hitting 91%. Game-changing therapies are within reach for other hard to treat diseases such as cancer, neurology, and diabetes; however, the cost of these new treatments will not be cheap. Once again, the specter of exploding healthcare costs looms large over the developed market in the near and medium term.

Environment

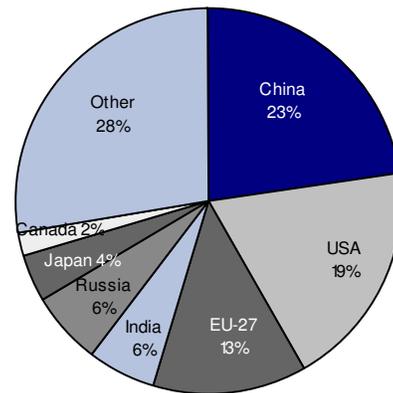
- ***Economic progress has undesirable consequences for the environment***
- ***Climate change is impacting government, corporate & consumer behavior***
- ***Hydrocarbon (fossil fuel) driven technologies are being slowly replaced***
- ***Green renewable energy sources will dominate in 30 years***

The definition for Environment is broad-based just like for Healthcare. It includes all human activity causing changes to our planet. The trends incorporate positive and negative influences that can be divided into two juxtaposed camps. First are trends occurring due to economic growth and the use of older hydrocarbon burning activities. In contrast, the second set of trends arises from environmental awareness and the adoption of newer technologies. Starting with the first, it's no secret that deforestation and urbanization go hand in hand with economic progress. Advanced industrial economies, almost by definition, produce greater CO₂ emissions. Coal generated electricity, along with fossil fuel burning transportation and other industrial activities, account for the bulk of the pollution in the U.S. (see pie-chart on left).

Total U.S. Greenhouse Gas Emissions by Economic Sector in 2013



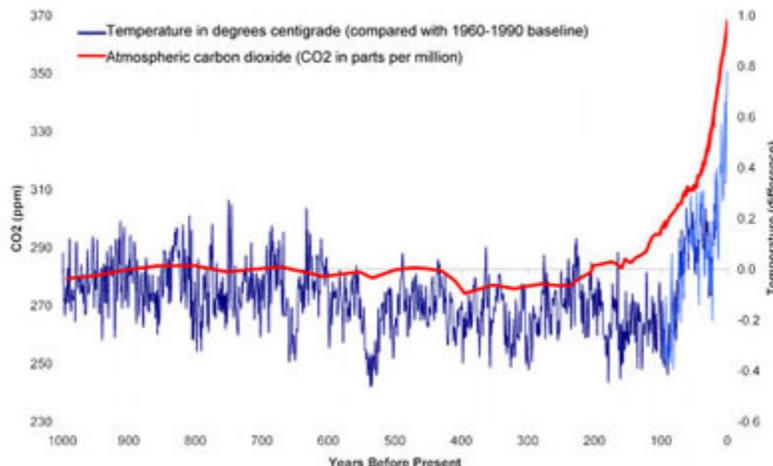
Global CO₂ Emissions from Fossil Fuel Combustion by Country in 2008



Source: United States Environmental Protection Agency. National CO₂ Emissions from Fossil-Fuel Burning, Cement Manufacture, and Gas Flaring. Total emissions in 2013 = 6,673MM metric tons.

The recent growth of China's economy has catapulted the country to the top of global polluters in a very short period of time. The pie-chart on the right shows that China already overtook the U.S. in 2008 as the biggest culprit in terms of total CO₂ output. China's emissions are a precursor to what could happen if (or when) other developing countries, such as India, catch up to OECD levels using older fossil fuel burning technologies. Industrialization and urbanization will release ever greater amounts of CO₂ into the atmosphere. Increased CO₂ emissions are widely believed of course to contribute to global climate change. The chart below depicts the temperature change over the last 1,000 years relative to the amount of atmospheric CO₂.

Temperature Change and Atmospheric CO₂



Source: Gore, Al (2006). An Inconvenient Truth.

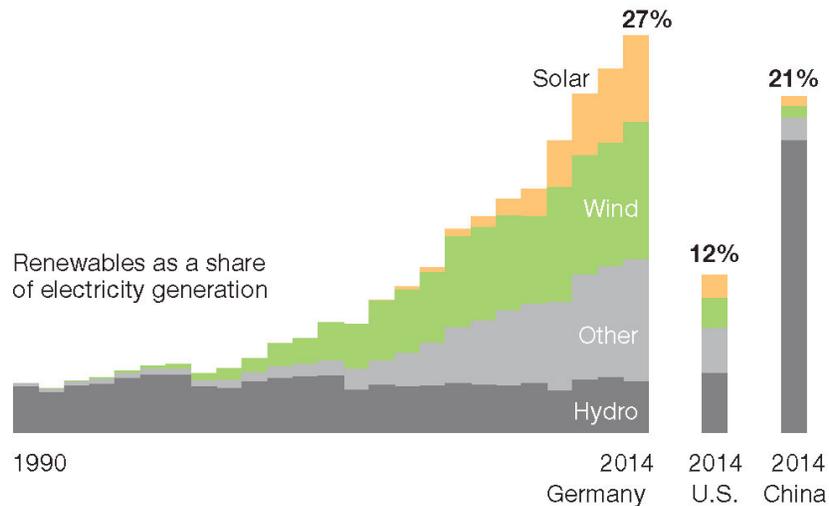
There is clearly a link. Whether or not one believes in human-induced climate change or that CO₂ is the reason, the observable facts are past dispute. The year 2015 was the warmest on record. Beyond the obvious threat of melting polar ice caps and rising sea levels, a warmer planet results in more extreme weather patterns, i.e. floods, droughts, heat waves, and storms. Living and working in, and insuring against, unpredictable climate conditions becomes more expensive. Higher CO₂ levels also lead to more acidic oceans. Roughly a third of man-made CO₂ gets absorbed by oceans. Whereas ocean pH has been slightly basic, averaging 8.2 over the past 300 million years, today it is around 8.1. This represents a 25% increase in acidity over the past two centuries (pH is on a logarithmic scale). The ramifications are dire. Coral reefs, nursery to close to 40% of all fish populations, have been reduced by more than a third.

Other side-effects of industrialization include urban air pollution, radioactive and chemical waste, higher mercury and lead levels, as well as pharmaceutical, plastic and sewage waste. Over 9 million metric tons of plastic get dumped into oceans annually, wreaking havoc on ocean ecosystems. Finally, the world's fresh water resources (incredibly only 1% of all water on earth) are being depleted rapidly. Recent data from satellites show that more than half of the world's largest aquifers are being drained faster than they can refill, especially in the Arabian Peninsula, India, Pakistan, and North Africa. Today roughly 2.5 billion people live in countries experiencing some form of water stress. According to the United Nations, that number will rise to 4 billion people by 2050 at current usage rates.

For all its obvious positives and inevitability, there is little debate that modern economic progress creates changes to the planet. At no other time in history have we burdened ecological resources so much. The big question is when (or if) will we hit a tipping point. To some people this is a controversial issue. Can the earth's balance really skew so much that it descends into a negative spiral of no return? Are we at risk of witnessing economic progress backfire if climate, soil and water conditions become inhospitable to life? The latest calculations (widely backed by the scientific community) suggest that in order to prevent serious long term harm to the planet, we need to stop the Earth's future average temperature from rising by more than 3.6 degrees Fahrenheit (2 degrees Celsius) from current levels. Yet with existing increases in CO₂ emissions, we may hit that level in less than 30 years. Regardless of whether such predictions end up becoming a reality, many people believe taking out an insurance policy to lower the odds of it happening is the best course of action to protect future generations. That means adopting policies and pledges now to reduce global CO₂ emissions to prevent climate change from progressing further. The leading policy makers, business leaders, and individual citizens who gathered at the Paris Climate Talks in December 2015 to advocate for action may or may not be right in the long run. Only time will tell. But they believe they have seen *enough* scientific evidence to suggest that we may be close to an environmental disaster precipice. Even Pope Francis weighed in recently about our moral duty to protect the Earth.

As a result, environmental awareness as witnessed at the United Nations sponsored Paris meeting has never been higher. It is driving the second trend within the Environment – a call to action and the adoption of green technologies. These will ultimately turn existing energy infrastructures upside down. The players behind it, interestingly, are compelled to act out of self preservation more than anything else. Diversifying into sustainable areas is easily justified for energy security reasons. A telling sign is that the U.S. military is spending billions of dollars shifting toward solar energy, renewable bio-fuels, and recycled water. It is the basis for the *energiewende* policies that have renewables supplying 27% of Germany's energy needs (see chart below) and Hawaii committing to have all its electricity come from renewables by 2045.

Germany's Explosion of Renewable Energy



Source: Kunzig, Robert (November 2015). Germany Could Be a Model for How We'll Get Power in the Future in National Geographic.

Although still behind Germany, U.S. renewables adoption is driving huge investments in solar and wind farms, with the amount of power generated nationwide from each rising 15-fold between 2003 and 2013. Today, two thirds of all new U.S. energy capacity comes from solar and wind. Wind installations are expected to climb 76% in 2015 alone. This investment is steadily eroding the “jobs versus environment” argument used by some as a reason not to support renewables. Naturally, green tech adoption is accelerating the scaling back of coal-fired utility plants in not only the U.S., but China as well. In fact, it is pushing China’s leadership to launch a major campaign against pollution, turning to alternative energy sources and natural gas in order to reduce smog enveloping its cities. Countries and states as diverse as Israel, Saudi Arabia, and California are also investing in desalination technology to solve fresh water scarcity problems. It is motivating intergovernmental organizations such as the World Bank to drop support for coal projects. It is causing forward looking companies such as Apple, Google, Microsoft, Yahoo, Procter & Gamble, Staples, Tesla and Mars Inc. to plan for off-grid independence and buy their renewable energy directly from developers as opposed to utilities. Finally, it is compelling individual citizens to put solar panels on their roofs, buy electric and hybrid cars, recycle, to think twice about using plastic bags at the grocery store, and to not litter on the beach. The implications are clear: for anyone on the wrong side of this powerful trend, future investment returns will be painful.

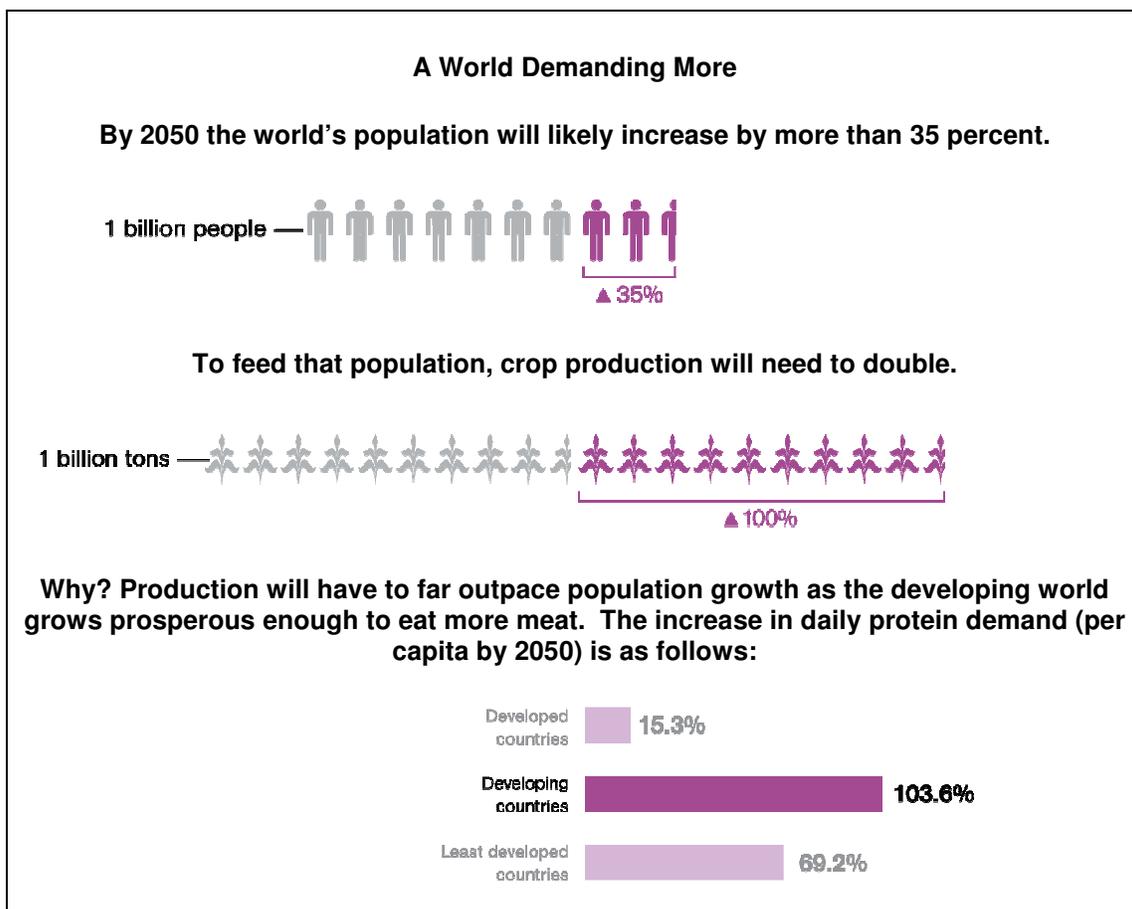
Agriculture

- **Modern industrial scale agriculture is not environmentally friendly**
- **The converging global diet is protein and grain rich**
- **Ag output will need to double in order to feed 2BN more people by 2050**
- **Sedentary lifestyles are causing obesity to spread rapidly**

Agriculture is closely linked to the Environment. But the issues and trends tied to food are so expansive and powerful that we choose to list Agriculture on its own. The definition encompasses everything related to the food value chain. It includes farming – the science, technology, logistics, economics and politics of what gets planted and harvested. It also includes the consumption of food – the factors influencing the availability of various foods and the preferences of consumers. The trends driving Agriculture can be broadly divided into two camps. The first has to do with the challenges of feeding 7.3 billion people (going to 9.6 billion by 2050) without depleting the Earth’s resources. The second trend involves the consequences of converging diets globally.

Solving how to feed everyone on Earth adequately is one of the most difficult problems facing humankind today. The current global agricultural complex is hugely inefficient. Close to one billion people suffer from chronic undernourishment. In fact, only 55% of global crop calories are used to feed people. Thirty-six percent goes to animal feed and the remaining 9% goes to bio-fuel. An estimated 25% of food calories and 50% of total food weight are lost in transit or due to spoilage before they get consumed. For all its wonders, modern industrial scale agriculture has an enormous carbon footprint due to transportation costs. It contributes to global climate change due to deforestation and through methane released by cattle and rice farms. It consumes more freshwater than any other human activity. It pollutes lakes, rivers and coastal areas due to fertilizer and manure runoff. And it perversely skews developed world farmers to produce meat and grains such as corn, wheat, rice, and soybeans at the expense of fruits, vegetables, and nuts.

As if this weren't challenging enough, the growing needs of two billion more people over the next 35 years will actually make matters worse. Population growth isn't the only reason. The spread of prosperity, especially (once again) in China and India, will drive increased demand for meat, eggs, and dairy. This puts pressure to grow even more corn and soybeans to feed more cattle, pigs and chickens. According to many estimates, the twofold jolt of population growth and richer diets means we have to double the amount of crops grown by 2050. The chart below from National Geographic describes the problem.



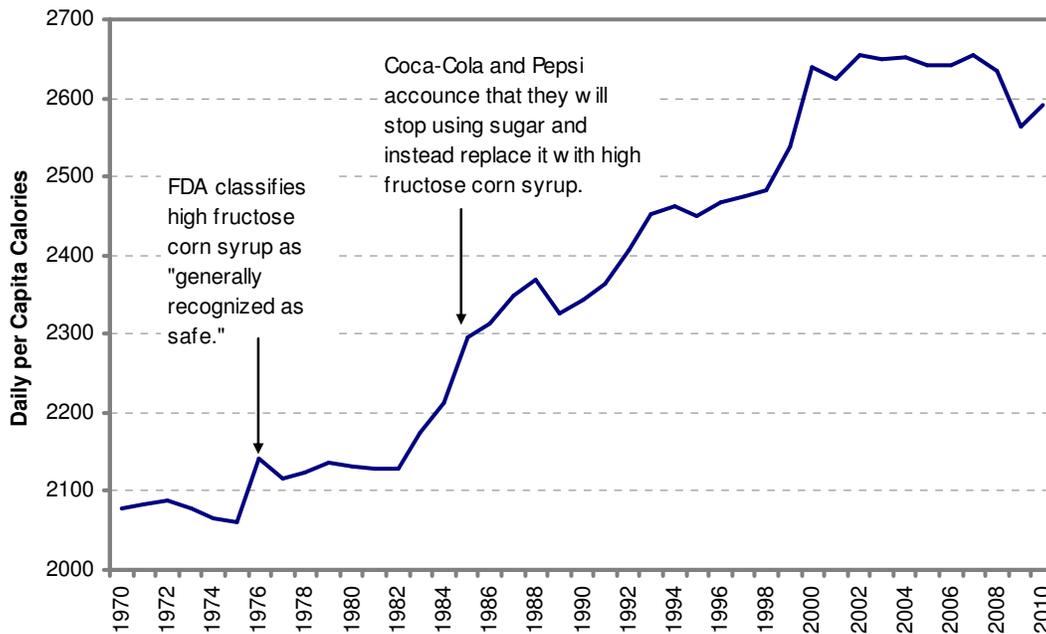
Source: Tilman, David. University of Minnesota and Foley, Jonathan (May 2014), A Five-Step Plan to Feed the World in National Geographic.

Accomplishing the above without drastically straining the planet will not be easy. There are literally millions of disparate self-interested parties involved. But the most obvious actions, suggested by researchers such as Jonathan Foley at the University of Minnesota, will require a combination of avoiding further deforestation, boosting yields on current farms, using resources more efficiently, changing diets (to be less meat-intensive), and last but not least, tackling the waste inherent in the food chain.

The second big trend in Agriculture has to do with today's modern diet. People around the world increasingly eat the same types of foods. The richer the country, the more calories its population gets from corn, wheat, rice, sugar, oil crops, and animal products. One would think this evolution of the human diet is a good thing. Except that our bodies are designed for hunting, gathering, and fishing. Today's sedentary lifestyle and meat rich diet inherently challenges our genetic make-up. Humans are predisposed to storing fat. We become easily addicted to sugar and high starch content foods. When government policies drive those foods to be offered at cheaper prices and in greater abundance than fruits, vegetables, and nuts, the effects are profound.

In the U.S., eating out in restaurants overtook grocery sales in 2015. Food portions have consistently gotten bigger. Daily calorie counts are much higher since the early 60s (see chart below). Theories abound as to why this has happened. One potential culprit may be the introduction of high-fructose corn syrup to the food and beverage industry in the late 1970s as a cheaper alternative to sugar. Propelled by abundant subsidized corn, today the sweetener is ubiquitous. Food companies have discovered ingenious ways to incorporate it into most processed foods which in turn has led to higher calorie counts. Not surprisingly, sugar consumption is through the roof. The latest government figures show average intake at the equivalent of 23 teaspoons a day compared to the recommended daily limit of 9 by the American Heart Association.

Average Daily per Capita Calories Consumed in the U.S.



Source: United States Department of Agriculture Economic Research Service.

To make matters worse, recent research links high-fructose corn syrup to metabolic syndrome and insulin resistance. The way our bodies process the sweetener, it seems, is different from other natural ingredients such as pure sugar. The end result is bigger waistlines in the U.S., with the rest of the world quickly following suit. According to The Lancet, the number of overweight or obese people globally tripled from 857 million in 1980 to 2.1 billion (one third of the world's population) in 2013. Today, thirteen percent of the world's obese are in the U.S, while China and India together represent 15% of the total. None of this would matter of course except that obesity leads to a host of expensive "lifestyle" related diseases. Thirty million people in the U.S. (9.3% of the population) have Type 2 diabetes, with an additional 8 million undiagnosed. In China, the rate is even worse, with 114 million diabetics (almost 12% of the adult population). Obesity among children in low- and middle-income countries is particularly alarming. At current growth rates, one in ten preschool children (under age 5) globally will be overweight or obese by 2020. There are severe downstream effects from childhood obesity, including cardiovascular disease, diabetes, and cancer. Given the incidence, it is safe to conclude that obesity is nothing short of

a global public health epidemic. The forces driving it are well entrenched. So far no country has made any progress to stem it. Unfortunately, the statistics over the next 15 – 20 years will get even worse.

The Opportunities

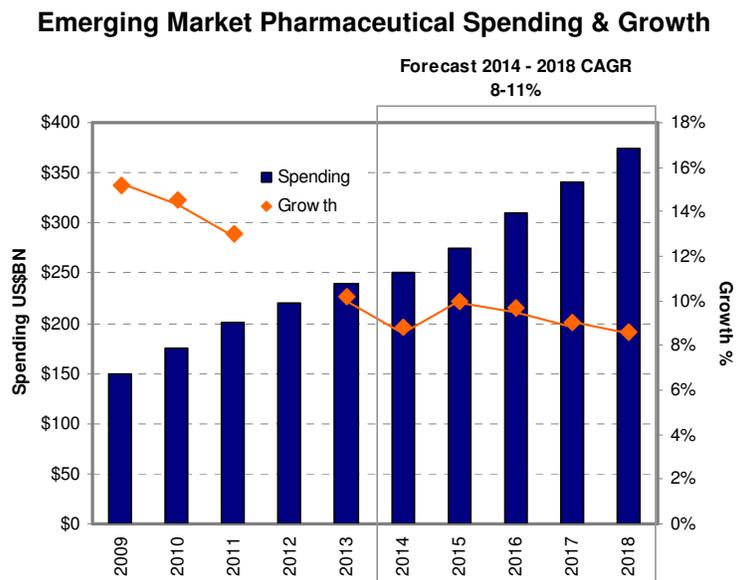
Healthcare

- ***There are over 1,000 liquid, publicly traded stocks globally***
- ***Diversity abounds within pharma, biotech, medtech, services, & fitness***
- ***Multinationals have exposure to both developed & developing markets***
- ***The list of local developing market players is growing fast***

The global investment opportunities in Healthcare have never been better. There are over 1,000 liquid, publicly listed stocks with market capitalizations over \$300MM. These encompass over ten GICS industries. Pharmaceuticals, hospitals, medical technology, healthcare services, diagnostics and testing equipment companies are just a few examples of stocks in Healthcare. Others include fitness, healthy lifestyle, weight loss, and any company whose products and / or services impact the overall health of the end user positively or negatively.

In developing markets, the emergence of two thirds of the world's population as newfound consumers of healthcare products and services signals high growth. There are many ways to participate in this growth. One is to find multinational companies with exposure to markets outside North America and Europe. For example, U.S. large cap pharmaceutical company Pfizer derived 23% of its \$49.6BN in sales in 2014 from Emerging Markets. That number was less than 10% ten years ago. While these figures may not be a significant driver of profitability or stock performance today, they will be in the future.

More immediate opportunities can be found through local emerging pharmaceutical players. Many of them show good returns from the sale of generics. According to IMS Institute, emerging market pharmaceutical spend will grow by over \$125BN over the next 5 years. Eighty percent of the sales will be in generic drugs. The historical and expected sales levels (and corresponding growth rates) are shown in the chart below. Markets in Russia, Turkey, South Korea, South Africa, Indonesia, and the MENA (Middle East North Africa) region have interesting domestic players. Because they are not as well known to international investors, valuations can be compelling.

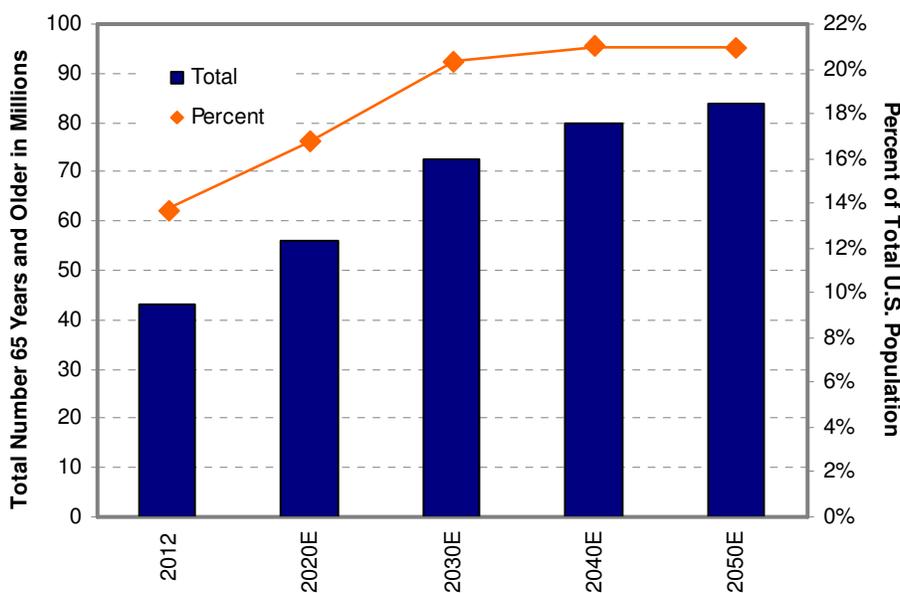


Source: IMS Market Prognosis, September 2014.

Therapeutic categories showing the most promise are similar in both developing and developed markets. Cancer, Type 2 diabetes, asthma, autoimmune, cholesterol, and hypertension rank at the top. The big difference is that branded drug sales still dominate in developed markets. Generics, however, show accelerated use even in North America and Europe due to patent expiries. Brand spending in developed markets has dropped by over \$100BN since 2012 due to patents coming off. As a result, overall pharmaceutical growth has slowed to low single digits. The beneficiaries of the new landscape have been generic but also specialty pharmaceutical companies. Successful branded pharmaceutical investing has been dominated by specialty medicines targeting niche populations with high unmet medical needs. Harder to make biologics with longer patent lives and favorable pricing have also been a good area. For example, modern insulins have proven to be very successful (with little generic competition) despite basic insulin patents expiring long ago. New mechanisms of action in disease states such as Alzheimer's, autoimmune disease, diabetes, and cancer have the potential to transform treatment. Availability of the newest drugs will be in developed markets where pricing and reimbursement are favorable. Eventually, the most innovative drugs will become broadly available in developing markets as well.

Prospects in Healthcare service, medical device, and healthcare equipment companies are less obvious in developing markets. The service space in particular has few private players because the infrastructures are simply not built out yet. That said, the opportunities in developed markets are exciting. Baby boomers in North America, Europe and Japan are entering their peak years for knee and hip replacements. In the U.S. alone, 67 million boomers will be suffering from arthritis by 2030. Nursing homes and companies catering to the elderly are on the rise. The number of people needing assistance will double to over 80 million in the U.S. by 2050. The chart below shows the changing demographics of the U.S. population as the 65+ year group goes from being the smallest subset to the second largest.

Projections and Distribution of 65+ Years Population in the U.S.



Source: Ortman, Jennifer et al., (May 2014). An Aging Nation: The Older Population in the United States, U.S. Census Bureau, www.census.gov.

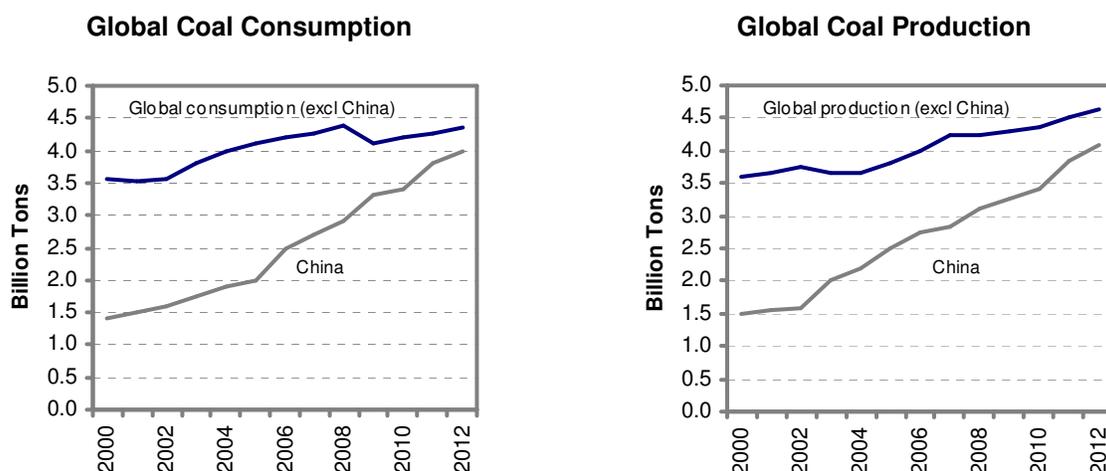
Expanded reimbursement due to the Affordable Care Act has led to better hospitalization utilization rates and profitability. Managed care companies in the U.S. are benefiting from expanded access, having retained their place as intermediaries of the broader government insurance plans. Obesity and resulting high levels of coronary heart disease ensure that medical devices such as stents will continue to expand. Another beneficiary is the dialysis industry. Health, wellness, and fitness companies in areas such as gym, sport equipment, shoes, and apparel are also getting a boost. Last but not least, the race to implement cost saving programs across the board in developed markets is alive and well. It guarantees

that businesses devoted to healthcare efficiency, technology, testing, and prevention will continue to be in high demand.

Environment

- ***There are over 3,000 liquid, publicly traded stocks globally***
- ***Sectors include energy, utilities, materials, industrials & consumer discretionary***
- ***The transition from hydrocarbons to renewables is accelerating***
- ***Almost equal number of long and short opportunities due to changing landscape***

The opportunities generated from Environment trends are even more numerous than those in Healthcare. They include over 3,000 liquid stocks globally with market caps above \$300MM. They span a range of GICS industries in sectors such as energy, utilities, materials, industrials, and consumer discretionary. Long term outcomes in the space tend to be quite binary. For example, global climate change is creating winners and losers in record numbers. From the standpoint of equity long / short investing, that means many long and short candidates. The shorts mostly (although not exclusively) fall into the camp of incumbent hydrocarbon dependent industries. Coal generated electricity generation stands out. As mentioned earlier, it is the biggest culprit of global CO2 emissions. The chart below highlights the extent to which China impacts the future direction of the coal market. In 2012, the country produced and consumed almost as much coal as the rest of the world combined.



Source: U.S. Energy Information Administration, International Energy Statistics (2015).

Looking at China and India's plans for future coal projects, it is clear the long term trend is not coal's friend. Although still the cheapest energy option today and used to generate 70% of the world's electricity, coal has lost its luster as a viable solution for the future. In 2014, China actually burned less coal than the year before (for the first time this century). If feasible capturing and storing CO2 technologies emerge, then coal can still remain the dominant fuel for decades to come. If not, its demise (albeit slow) has begun.

As for other fossil fuels, oil presents a quandary. Record oil output from U.S. shale drilling and lower prices offer plenty to think about. Are the Saudis and OPEC extending the world's addiction to oil by another 10 – 15 years by pushing prices even lower? At current growth rates, the number of gasoline and diesel powered cars globally will double to over two billion by 2030. This is largely due to China and India's growth. On the other hand, dramatically better fuel efficiency means slowing demand growth even with more cars on the road. Natural gas for both electricity generation and transportation will likely expand as a result of its cleaner profile. Shale drilling in the U.S. has increased natural gas output and depressed prices, making its appeal as a substitute fuel for electricity generation more appealing.

However, natural gas alone cannot solve the problem of global climate change. In fact, methane leakage from gas production was recently revealed to be much greater than previously estimated. This leakage is an important part of the climate change equation because methane is a far more powerful greenhouse gas than carbon dioxide. Furthermore, hydraulic fracturing (fracking) requires huge quantities of water and is a risk to underground water supplies.

Dwindling fresh water supplies remain another key problem generating plenty of investment opportunities. Companies involved in water testing, treatment, metering, filtration and desalinization offer interesting possibilities. So called “grey water” and non-potable water recycling for irrigation use present possible solutions for drought stricken areas such as California. Demand for products and services touching all aspects of water use will continue to increase, including in non-obvious areas such as the apparel industry. For example, consider that it takes on average 7,000 liters of water to produce one kilogram of clothing, with most of the water used in the dyeing process. Last year, the industry produced 100 billion garment pieces, a staggering figure and source of growing concern for fresh water conservation. In response, sporting goods companies Nike and Adidas adopted technology that doesn’t require water for clothes dyeing, thus creating huge savings for themselves and the environment. Along with other technologies that offer solutions to alleviate or reverse global climate change, these new dye machines illustrate an entire universe of exciting long opportunities. Solar, wind, geothermal, nuclear, and wave technology will all be key pieces of a greener future. Recycling, insurance (against natural disasters), waste management, and energy efficiency are other growth areas. Retrofitting older utilities, buildings and trucks to boost efficiency and run cleaner will provide important new markets and demand for a variety of building and industrial companies.

Micro grid infrastructure and battery storage could be powerful disruptors and redistributors of the traditional electricity grid as we know it. Technology improvements still need to be made in both fields. But conceivably a large part of the developing world will end up building power grids that are different from the current standard. For the 1.1 billion people worldwide currently without access to electricity, new technologies such as individual solar powered lights are already transforming daily life. In the same way that mobile phone technology allowed developing markets to leapfrog telecommunication infrastructure and bypass landlines, localized electricity generation is becoming the norm. As for battery storage, Tesla is operating pilot programs that may one day allow utilities to smooth out renewable power generation during the day with peak demand in the evening, thereby reshaping the load curve. Eventually, commercial and residential users will sell as much power back into the grid as they take from it. And electric utilities will naturally evolve into platform providers (for efficient energy redistribution) and away from their current role today as one-way power providers.

In the developed market, Apple Inc. is planning for grid independence by contracting its own solar farm from First Solar to power all of its stores, offices, headquarters and a data center. Additionally, Google, Microsoft and Amazon have invested heavily in wind energy. It speaks volumes about the direction of green investing when these companies are leading the charge. They see climate change as a business risk. Michael Bloomberg, Hank Paulson and Tom Steyer have been vocal about the need to think of global climate change as a business risk with their Risky Business non-profit project. Before long, most forward thinking company managements will likely adopt similar strategies that bet on green technologies. We will all be environmentalists not by choice, but out of necessity. The investment opportunities arising from this transition to renewables will be lasting and powerful. And as Paris has shown, there will be no going back to the fossil-fuel driven economies of the past.

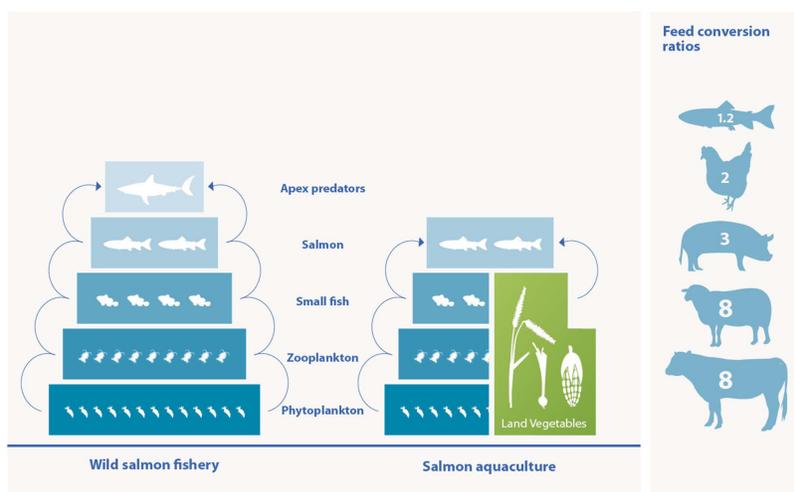
Agriculture

- ***There are over 1,500 liquid global stocks***
- ***Industries include materials, chemicals, beverages, food products & restaurants***
- ***Multinationals are successfully tapping into developing market growth***
- ***Natural, organic, and healthier food / beverage choices will continue to trend better***

The trends seen in Agriculture carry over into myriad investment opportunities. Over 1,500 stocks fit the criteria, falling into GICS industries such as materials, chemicals, beverages, food products, food & staples retailing, and restaurants. How the world tackles the challenge of feeding two billion more people over the next 35 years will determine which investments are successful and which are not. There are several ways to play the trends. Fertilizer, crop protection, irrigation, hybrid seed and livestock feed companies are obvious starting points at the beginning of the food value chain. Drought resistant seed technology in particular is an area that will see strong investor interest. Drone, GPS and satellite imaging technology used in planting and harvesting will be areas of growth. Adoption of sustainable farming practices, if successful, will have different outcomes versus current practices that deplete water and soil resources. Large-scale mechanized farms, while efficient at growing single crops, may have to adopt crop rotation to preserve valuable soil nutrients. Agricultural conglomerates such as Cargill may need to be incentivized through changes in government subsidies. Sales and profitability along the agricultural value chain will be impacted positively or negatively as a result.

A key investment opportunity lies in protein demand. Growth in meat consumption is synonymous with prosperity. But doubling crop production to meet this demand will be challenging. Which kind of meat is grown makes a big difference. Chicken and fish require fewer resources than pigs and cattle. The chart below from Norwegian salmon farming company Marine Harvest shows the efficiency of salmon's feed conversion ratio (measured as the ability to turn feed mass into body mass) versus beef and other animals.

Energy Efficiency of Protein Sources

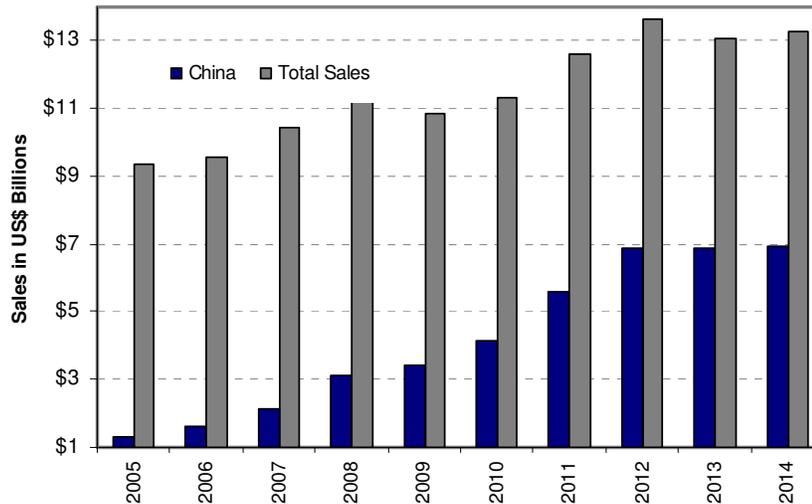


Source: Marine Harvest, Salmon Supply and Market Outlook, March 2013.

Companies that focus on and develop more efficient ways to grow protein while lowering their environmental footprint will be successful. Aside from meat producers, other food companies that cater to developing markets are seeing strong sales growth. Large multinationals such as Nestle generate over 35% of sales in developing regions. Ten years ago, that number was less than 20%. Dairy consumption offers an interesting glimpse at how the western diet is taking hold. In North America annual milk consumption has leveled off in the low 70 liters per person while in Europe it has remained steady in the low 60 liters. In China, however, per capita milk consumption was only 8 liters in 2008, doubling to 17 liters by 2013. Even accounting for a higher level of lactose intolerance among the Chinese, dairy growth will remain strong for years to come.

Supermarkets and restaurant chains are seeing success as tastes converge. American fast food companies are riding a wave of profitable growth in developing markets. Yum! Brands (owner of KFC and Pizza Hut), for example, is the leading restaurant developer in China with close to 7,000 restaurants in over 1,000 cities. It opened 700 new units in 2015. China accounted for 52% of Yum!'s sales in 2014, up from 14% ten years ago. The chart below shows the rapid rise of Yum! Brands' Chinese sales.

Yum! Brands Sales



Source: Bloomberg, LP. Yum! Brands company filings.

Local publicly traded companies are benefiting as well. Barriers to entry and local taste preferences provide opportunities for regional leaders to grow. As the supply chain becomes more complex, food safety and quality control become more important but also more challenging. Recalls of tainted meat, milk and other food categories are on the rise. Testing standards in both developing and developed markets need to improve and spending in this area will grow.

More mature markets in North America and Europe create a different set of opportunities. Many categories within grocery stores, restaurant concepts, and food products are highly competitive. They offer zero to low growth and suffer from price competition with multiple players fighting for market share. Shorting opportunities abound, at least in theory, within fast food restaurants seeing declining traffic or soda manufacturers selling high fructose corn syrup-laden soft drinks. One area witnessing growth, however, is healthier and organic food and beverage items. Brands and categories offering fewer calories, made with natural and / or organic ingredients, have taken off in recent years. The success of companies such as Whole Foods, WhiteWave Foods, and Chipotle Mexican Grill prove that consumers care about food quality and sustainability. They are also more aware of the necessity and benefits of exercise. They drink smoothies packed with nutraceuticals, practice yoga and shop at Lululemon and Nike. Health officials and legislators are raising the pressure on companies contributing to the obesity epidemic. Going forward, corporations that cater to the growing demand of healthier options and changing consumer tastes will ultimately perform better.

Key to Differentiated Returns

Positive differentiated returns are valuable to investors seeking optimal risk / return portfolios. This is because uncorrelated positive returns, when combined with more traditional correlated ones, allow a portfolio's efficient frontier to be pushed out, i.e. you get more return for less risk. Alternatives (hedge funds) historically used to be a good source of differentiated returns. They delivered "alpha" driven gains, or returns that were largely independent of market movement. Unfortunately, such differentiated returns have become increasingly difficult to find in today's market. Even in the global long / short equity space, the vast majority of funds exhibit high correlation (> 0.8) to equity indexes. Since the 2008 financial crisis, correlations have actually increased. To make matters worse, few hedge funds have kept up with equity index returns over the past seven years. It begs the question of why investors pay 2% / 20% fees in order to get performance that largely tracks the market.

The reasons for the high correlation in equity long / short vary from fund to fund, of course. We'll save a detailed analysis of the industry's shortcomings for another White Paper. But generally speaking, high asset-class and sector correlations, driven by aggressive central bank interventions since 2008, have made it harder to run hedged portfolios. Other factors conspiring against funds include algorithmic trading models, high frequency trading, the preponderance of ETFs, instantaneous and universal access to market information, and short holding periods. Finally, there is simply more competition today than 20 years ago. With tens of thousands of players all vying to outperform each other, trades have become crowded. The end result is that funds inadvertently chase and react more than they invest.

Several strategies can help counter the forces that are driving high correlation. Equity funds can hold super concentrated positions, ignore index sector weights, use activist tactics to pressure managements, or lever up to boost returns. All of these can generate differentiated returns but they can also lead to higher volatility. As we saw in 2008 during the market meltdown, non-diversified portfolios end up being problematic. They are not designed to withstand 3-standard deviation events or defend well during panics.

Another, more diversified means for generating positive uncorrelated returns is to draw investments from a universe that *itself* is uncorrelated to the broader equity market. Such a universe should have stocks with different risk / return profiles and betas. Ideally, its constituents should also exhibit different return on invested capital (ROIC) generation, valuation characteristics and business models. Global H.E.A.T. fits the bill on a number of levels. First, it excludes entire GICS sectors such as financials, information technology, and telecommunication. Out of the gate, that eliminates one third of stocks in most indexes. After more culling and narrowing of names to those impacted by Healthcare, Environment and Agriculture, it leaves out more than two thirds of stocks. Second, with GICS industry groups ranging from pharmaceuticals and insurance to energy and food, beverage & tobacco, it still offers a broad enough choice of stocks that are uncorrelated to each other. Third, many sectors such as healthcare and utilities are defensive and offer lower betas. Long holdings in these can significantly reduce correlation during market downdrafts. Fourth, it is global. Last but not least, the trends in Healthcare, Environment and Agriculture position it uniquely to capture exciting once-in-a-lifetime changes. Catalysts abound among the more than 5,000 stocks in Global H.E.A.T. The trends will be drawn out over a long period. In many ways they will transform the world as we know it. Since several trends are in their infancy, timing the entry perfectly will be challenging. Nonetheless, beginning to build exposure now and participating with a multi-year outlook can help drive positive differentiated returns in the future.

Is Trend Investing Enough?

Trend investing has many definitions. One that is frequently used relates to charting and technical analysis of stock movements. By contrast, our definition refers to the secular trends driving the Global H.E.A.T. universe. As discussed above, they are numerous and powerful. No doubt many companies' fate will be determined by them. Stock performance in turn will be influenced by management actions in response to them. An important consideration, however, is whether investing in these trends is enough to generate good results. The answer is no. The universe is just a starting point. It is a useful tool for finding exciting stocks. But it is only the beginning of a multi-step investing process.

Good stock selection should involve fundamental analysis of a company's drivers and an understanding of its accounting. It means making sure management's goals and interests align with investors. It entails projecting future growth rates, margins, and returns on equity (ROE) based on a business's competitive advantage. It requires correctly valuing the equity in the context of history, peers, interest rates, and most importantly, the aforementioned ROE that accrues to shareholders. From there, the process moves to portfolio building. Risk parameters need to be set. They need to be adhered to with respect to position sizing, sector exposures, overall net and gross exposures, and volatility levels. Finally, at the end of it all, investors need to make one of the most important decisions of all – determining the investment's time frame. Patience and portfolio turnover are stylistic preferences that can turn into decisive factors influencing successful stock selection.

In a world where bottom-up stock picking is no longer the purview of a select few on Wall Street but rather tens of thousands of firms all teeming with CFAs, MBAs and Peter Lynch wannabes, the prospect of making money consistently using a short time horizon has gotten extremely difficult. The competitive advantage of getting a quarterly earnings result correct is not what it used to be. Part of the reason for this is that company managements are conditioned to manage to short term results. They are exceedingly adept at managing expectations. Most of them consistently beat quarterly estimates. Adding to the problem, investors themselves expect immediate gratification. Performance is measured monthly with little forgiveness for underperformance. If ever there was a time for espousing a longer term investment horizon, now is the ideal time. In fact, arguably the only advantage that has not been competed away in today's marketplace is patient, low turnover investing. Since few investors are doing it, by definition it can counter correlation to markets yet still provide attractive positive returns. When combined with a unique investment universe such as Global H.E.A.T., it can lead to surprisingly beneficial results.

Synergy

Global H.E.A.T. has one final feature worth expanding on. In an increasingly interconnected world, there are synergies emerging between Healthcare, the Environment and Agriculture. They do not always translate into investable actions. Nevertheless they act behind the scenes and help stimulate "outside the box" thinking. Second and third derivatives of trends can be spotted more easily when seen through the lens of our holistic universe. For example, there is a clear link between economic progress and longer life expectancy (Healthcare) which carries over into urbanization and increased pollution (Environment). Furthermore, as developing nations start to afford richer diets, it leads to greater protein demand (Agriculture). Increased meat production in turn magnifies water needs and creates fresh water shortages that have ecological consequences (Environment). And, as we outlined earlier in the paper, richer diets cause obesity rates to go up (Healthcare).

Additional relationships include the impact on river habitats (Environment) of fertilizer and pesticide run-off from farming (Agriculture); the growing incidence of asthma and other diseases (Healthcare) caused by increased air pollution (Environment); clearing of forests to create more farmland (Agriculture) contributing to greater CO2 levels and climate change (Environment); warmer temperatures and rising ocean levels (Environment) leading to spread of communicable and waterborne diseases, famine and malnutrition (Healthcare); growing levels of plastic garbage and residue in oceans (Environment) killing off bird and fish populations (Agriculture); EPA mandates for ethanol production (Environment) causing 1:1 correlation and volatility between oil / agricultural commodity prices (Agriculture). The list goes on and on. It can end up being circular in nature when cause begets effect which in turn begets another cause. But the point is that looking at the three areas in isolation no longer makes sense in today's interdependent world, especially when there is a growing convergence of so many investment themes. A unified holistic approach is necessary, and Global H.E.A.T. provides it.

Conclusion

Global Healthcare, Environment and Agriculture Trends are powerful drivers creating exciting opportunities in equity long / short investing. Factors such as demographics, economic growth, global climate change, and eating habits are making these opportunities among the best in decades. Now is an auspicious time to participate in them. The trends are a great starting point for discovering new investment ideas. Fundamental stock analysis and a longer time horizon are also needed to create superior risk / reward portfolios. Global H.E.A.T.'s uncorrelated characteristics can help generate differentiated investment returns. Finally, the growing synergies linking Healthcare, Environment, and Agriculture can lead to unconventional investment insights.

About the Author

Santtu Seppälä is the Founder, Managing Member, and Chief Investment Officer of Kiitos Capital Management, LLC. Mr. Seppälä has 17 years of investment experience. Prior to starting Kiitos in 2008, he worked at Cantillon Capital Management for 5 years, both as an analyst for all Cantillon funds, as well as the Portfolio Manager for the Cantillon Health Fund. Prior to Cantillon, he worked at Lazard Asset Management for 5 years, researching stocks for international large, mid and small-cap funds, both long and short. Mr. Seppälä holds an MBA from The Wharton School and a BA in Ethics, Politics and Economics from Yale College.

Kiitos Capital Management manages Kiitos Global Opportunities, a long / short equity fund focused on stocks impacted by Global H.E.A.T. (Healthcare, Environment and Agriculture Trends). Kiitos has been investing in Global H.E.A.T. stocks for seven years, generating positive returns with below market volatility and low correlation of 0.2 to global equity indexes. The Fund is a liquid, diversified portfolio made up of 50 – 70 positions. It employs a value-based, ROIC focused and low turnover investment strategy to generate uncorrelated returns over the long term. Kiitos is headquartered in Beverly Hills, California and is a registered Investment Advisor with the State of California.

For more information, please contact:

Santtu Seppälä
Managing Member and CIO
Kiitos Capital Management, LLC
9665 Wilshire Boulevard, Suite 888 | Beverly Hills, CA 90212 | USA
Work: +1 310.362.0880 | Fax: +1 310.362.0881 | Mobile: +1 917.868.6380
Email: sseppala@kiitos.com | www.kiitos.com

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