Patrick OShaughnessy:

So Jeremy, thank you so much for doing this with me today. You've had such a long and interesting career in the field of investing that my opening question is a bit of a motivational one, which is what is the thing that for you is the compulsion or the deep curiosity that keeps you going in the field of investing specifically, despite long and large success?

Jeremy Grantham:

That's a difficult question. For a starter that's a killer. I like analytical problems, data. My idea of heaven, I know it's politically incorrect, is the Corona virus. It's flooding me with interesting, contradictory, questionable data. Some is high grade, some is low grade and some is peer reviewed. Some is rumor and it involves every aspect of humanity and politics and yet in a kind of grim sort of way, there is a scorecard on each country's response.

Patrick OShaughnessy:

Hmm.

Jeremy Grantham:

And so that is the very essence of what has turned me on in life. It's analysis and statistics under uncertainty and where humans intervene and the quality of the data is mixed.

Patrick OShaughnessy:

You've seen such a large transformation of both investing and capital markets over the years. What, in your opinion, stands out the most from the perspective of someone trying to earn, we'll call it excess return, versus a very bland, broad market benchmark? What today is more important in that pursuit then was a few decades ago?

Jeremy Grantham:

I think there's always been two major approaches to managing money. And one of them, which was effective in the 1920s and is equally effective today is, at the individual stock level in particular, to focus on unappreciated changes in the future. What is going to happen and find out, deduce what the market thinks and look for unappreciated changes, good and bad and bet against the market. And bet your analysis has picked things up that the marketplace has missed. So fundamental old fashioned analysis is effective at any time.

Jeremy Grantham:

We were lucky when we came in, in that some parameters that somewhat reflected a value had worked pretty well as contrarian indicators for 80 years or so when we started 40, 50 years ago. And those were things like price to book, PE, price to cash flow, price to sales. What I have long thought of as dopey value. What they are really is just expressions of the market's discussed and the cheapest price to book are really the assets, which dollar for dollar, the market thinks are the least useful. And the lowest PE are the earnings the market least believes will be sustainable and the highest yield are the most likely to be cut or not sustained.

Jeremy Grantham:

There's no reason why those things should work and indeed for 20 years now, they haven't been working. But in the old days they worked because the market loved comfort so much that it was constantly overpaying a little bit for the Proctor and Gambles and underpaying for those nasty cyclicals that kept getting excess production and getting crushed. And we came in, my first firm, I started in 1969 and we applied those standard Graham and Dodd techniques. And they worked beautifully. Life was simple. They didn't work every year. And you occasionally had a string, a painful string, of two, three or even four years where growth stocks were trash and upset your clients.

Jeremy Grantham:

But they came back, made up for the lost ground. And so if they gave up four points one year, they would make it back and deliver the usual four points a year the following year. And so life was easy. And I think the general caliber of competition back in those days was very weak. And therefore, if you did decent analysis and looked for value, you could find it.

Jeremy Grantham:

So we were able to build simple mechanistic models, giving points for cheap book and so on and have a win on a very broad basis. So we could manage a lot of money. And we were winning two out of three years and adding a few points on average a year. And that era perhaps started to end around 2000 and too many machines were picking it up; too many quants, too much money.

Jeremy Grantham:

And pretty soon the historical aversion to cheap stocks had disappeared because they acquired the reputation for having won. The quants made it clear. They understood that for 80, 100 years into the midst of time, these were factors that worked. And indeed academics wrote it up and got a lot of credit for it, such as simple minded idea.

Jeremy Grantham:

And anyway, that was the past. And those early pickings have gone leaving, as I said, old fashioned labor intensive, stock by stock analysis; not only labor intensive, but risk intensive, because you have to bet that the things will change and you have to bet that the market is wrong. And that gives a lot of people, not surprisingly a lot of trouble.

Patrick OShaughnessy:

One of the things that GMO is most well-known for is its asset allocation or seven year forecasts of major investment categories or groupings. Talk a little bit about how that idea has evolved and what sort of the key components are, analytic or quantitative, that go into that very popular concept.

Jeremy Grantham:

Basic mean reversion is the bedrock idea. So we studied the rate at which asset classes tended to mean revert and around which levels. So asset allocation is profoundly based on history repeating itself or following certain principles. And one principle is that if you have an abnormally high return in an industry or a company or a marketplace, it will attract more competition and drive it down to some historical normal and it should work that way. In a healthy capitalist system, if a subset of an industry starts to make 40% a year return, everyone should drop what they're doing and spend some of their energy and money copying it as faithfully and as quickly as they can. And if they do, you have a dynamic rapidly moving capitalist system. You also have one in which those returns will get bit down pretty fast and more towards be more average returns.

Jeremy Grantham:

That's a healthy system. Now we've diverged away in recent years from that, last 20 years. And the degree of monopoly, particularly in the US has climbed. The degree of corporate influence of government and regulation has climbed which facilitates monopoly. The willingness of the justice department to break companies up has declined, not surprisingly under those conditions. And consequently, the returns have been above average for much longer than would have been feasible in the old days. They would have been competed down and that process has weakened. And in the short run, it's great for stock prices in the long run, it's bad for the capitalist process. It definitely shows a weakening in the competitive spirit and speed. Conservatism and high return is put ahead now of growth and being the first and the biggest at something new. Not that there aren't splendid firms who still do that, but just the meat and potatoes enterprises have become more conservative.

Patrick OShaughnessy:

Hmm. If you take the old kind of adages of don't fight the Fed and don't fight the tape, perhaps we need to add don't fight FAANG. And using FAANG here is just a convenient, convenient acronym for large growth kind of technology complex. Do you agree with that? And what's an investor to do in face of the reality on the playing field here that these companies have just dominated, not only market returns, but fundamental growth.

Jeremy Grantham:

Well, to take your point in pieces, don't fight the Fed has had a pretty good record and has not applied to my life or GMO. We have always played value first and if the Fed wanted to be on the other side of that game for a while, we would carry on regardless and eventually the great bubbles broke. It didn't mean that we didn't catch the top. We were painfully early, but they broke and we won and we made more money on the decline than we lost on the upside. Classic would be the 2000 tech bubble; we didn't really fight it until the PE on the market became the highest in history.

Jeremy Grantham:

The highest PE in history had been 1929 at 21 times trailing. And by early '98, let's say January '98, it was at 21 times earnings. And we were officially very bearish. Why would you not be with the highest PE in the history? Anyway, it went from 21 to 35. And it went from 21 to 35 on rising earnings. And at the time the earnings were vastly overstated and they were later revised downwards, which was cruel and unusual extra punishment for everybody, bulls and bears, so that the earnings people thought they were looking at an early 2000, were revised down probably more than ever before in history. But at the time they looked to be at a very princely level. And so earnings have been marked up enormously in the two years. And the PE had shot through the roof and it was a very grievous demonstration of business risk for us. And we lost half our asset allocation business at least. And then of course the S&P collapsed and the much cheaper alternatives did much better.

Jeremy Grantham:

So the US REITs which yielded 9.1% at the top of the market were up 30 by the market low, so the S&P minus 50 US REITs plus 30. And they were said to be entitled to behave like small cap. And of course, small cap has a high beta. So small cap was meant to be down at 65 if the S&P was down 50, but the REITs, a subset of small cap were up 30, because they were so cheap and a yield of 9%. And the S&P had the lowest yield in its history, ever, in March of 2000, that yielded, I think 1.6 and everyone was saying, "Oh, well, yeah, but the S&P has a higher growth rate of its dividends". And we did the data and we'd pull it out and show them and say, "Yes, you're absolutely absolutely right. The S&P dividend stream has grown 1.1% faster than the REITs". And that's why you get an extra seven and a half points of extra yield.

Jeremy Grantham:

Anyway, so the principle was, we were perfectly happy to ignore what the Fed was doing. And going along with the Fed is a different game. It's short term, take all these other factors together, stir them up and get lucky and speculate. But I think if you're going to be an investor going for value, you have to be prepared to ignore little things like the Fed.

Jeremy Grantham:

The Fed, take today, the Fed is swamping the system with paper. It's not producing jobs for people who are unemployed. Unemployment may go higher than 20%, much, much worse than anything since the great depression. And the Fed is not going to address that. The Fed is not FDR having a ride for the second time with great work programs, to build bridges and parks and refresh our railroad system and

upgrade our grid and all those good things and winterize all the houses in the Northeast or the North. That's real stuff, but paper is not the same.

Patrick OShaughnessy:

Hmm.

Jeremy Grantham:

So 10% of the people drop out of the workforce and you throw 10% of the GDP in paper two and a half trillion at it and you think, well, at least that will make confidence better. It will help. I get that. But if you take that thought experiment and extend it, and you imagine a world in which everybody is unemployed, and you throw $25 trillion of paper, 100% of the GDP at it. What do you have? You have no goods, no services to buy and lots and lots of money to buy it with. So of course, it's intrinsically inflationary process. We are cranking out paper as the output of goods and services drops way down and that can easily go wrong.

Jeremy Grantham:

In the short term a lot of it flows through to the market and pushes the market up. But my guess is, based on history, when the earnings are finally presented as down 30, 40, 50%, the PEs will drop and the market will decline. That is at least the risk is it not? So you have today a market that is at the same price it was last June when everything looked great. And everything is not great now and we know it, but you have the same stock price. So is this a fairly fantastical circumstance.

Jeremy Grantham:

Now, given the power of the Fed, you can't be absolutely certain that it won't go on, but you know it's not guaranteed. You know there is a balance of risk and return. And since the prices are already high by historical standards in the top 10% before this even started, and the debt levels are the highest they've ever been, you know you're playing with fire. Is it not prudent to be very cautious?

Patrick Oshaughnessy:

Hmm. Do you think that the world presents more opportunity for an active investor than in years past today? And I asked the question, because what we see is a lot of those record price levels are driven by this don't fight the FAANG concept, right? That the multiples on these companies are very high and therefore the markets is higher, but that within the market, there are a patch of extraordinarily cheap stocks. So valuation spreads are quite wide, at least in the US. Do you see something similar and what is your take on where opportunity may lie. I'd love to talk about resource stock investing here as well in today's market environment.

Jeremy Grantham:

I'd like to say to my colleagues and clients for that matter, that this is the fourth great stock market event of my career and rightly or wrongly, we took a position in the previous three, where we felt nearly certain that we were right and we presented it that way.

Jeremy Grantham:

I did a piece for Fortune where my title was Three Near Certainties for Uncertain Times in the spring of '08. The near certainties was that the housing market would collapse, the risk premium would rise, and profit margins would get whacked. I mean, of course they were near certainties. The one before that was the tech bubble. The tech bubble really had a lot of craziness that sadly may be missing today. The pet.coms, if you will, there were just hundreds of new enterprises aimed at the internet, which didn't make any sense. The very great majority of them went out of business completely. There were the main tech companies who were selling at 50-60 times earnings, just ludicrous. You could be nearly certain that that whole thing would collapse.

Jeremy Grantham:

There were plenty of cheap things to own in the bond market, the real estate market, and the small cap market, and the value market. They were all gloriously cheaper than the tech and the internet. The one before that was Japan, where in a way, the mother and father of all bubbles, the Japanese real estate market, this is probably the biggest bubble in the history of capitalism, much bigger than the South Sea bubble. The land under the emperor's palace really was, in 1989, selling for a value greater than that of California. We spent a couple of days kind of tracking it down. It really was true. The stock market, which had never sold over 25 times earnings went to 65 in Japan. Of course, we were early, painfully early, but we made a ton of money on the round trip. We were certain that we would win.

Jeremy Grantham:

We didn't know when the hell we would win. The timing is always tough, but you know in the end these things will break, we thought. We made a big fuss about it at the time. In 2000, I debated the boss of Wharton, Jeremy Siegel, I think it was nine times, including some very big audiences where he was the bull and I was the bear, and touting regression and the collapse of the S&P. Also in 07-08, we were absolutely confident the US housing market would break. We had all the data on the housing market, and this was not just a bubble. This was a three sigma event. Our definition of a bubble is a two sigma every 40 year event. A three sigma event is to every hundred years.

Jeremy Grantham:

Basically there had never been one like that in the US real estate market. California would bubble, but Illinois and Florida would be busting at the same time. America became famous for that, but it took Bernanke, Greenspan, it took their devoted attention to have every real estate market in a diversified country like the US bubble at the same time. It took them to miss the point, of Bernanke saying the US real estate market merely reflected a strong US economy. I mean, it was complete nonsense. Where were his statisticians when you had a hundred year bubble? Anyway, the housing bubble proceeded beautifully to peak and slow down. Then, under the surface, we were aware that some of the subprime was deficient. We had no idea how deficient, by the way, but we knew it was going to cause a crisis.

Jeremy Grantham:

We didn't know how much was owned in Europe and so on, but we knew it was way enough to create a major league recession. The housing market coming back down we calculated with a little bit of overrun below trend would remove $10 trillion worth of perceived wealth from US homeowners. Now, that is guaranteed to be an economic problem. A really severe problem, and it was. The market came down perfectly. They were all near certainties. This one, without trying to pun, this one is novel, this is different. It is completely original. We have never had anything like this. I want to come back to your FAANGs, because they are novel in a completely different way. Everything about this cycle, going back almost 20 years, has been different. I argued with Grant, of Grant's Newsletter at his annual conference. I took the, he called me an apostate, invalid, because I had given up the pure religion that everything regresses to the mean, or this time is never different.

Jeremy Grantham:

The five most dangerous words or whatever it is in the English language said John Templeton. I responded by saying, "Forget the four words, the five most dangerous words in the English language is 'this time is never different'." Because occasionally, of course, something really important happens that is different. The Coronavirus is one of them. The entire base of American capitalism has shifted since about 2000. With the emergence of much higher levels of return, many more stock buybacks, and much more conservatism, the number of people employed in new enterprises in America that are one or two years old has halved since the late 1970s, halved. We're simply not as aggressive a capitalist system as we were. Everything has changed. Now into the teeth of that comes a virus, and it doesn't arrive at any

old time, by the way, it arrives at the end of a 10 year, longest economic upswing in history with the lowest unemployment for eons, but with the highest corporate debt levels ever.

Jeremy Grantham:

Some very smart people believe it's badly understated in official data, and the highest ever sovereign debt levels around the world, with weakness in the EU and with odd leadership in the US. A very vulnerable time, the end of a 10 year cycle, exactly when you'd expect things to start going wrong. When you're exposed to high levels of debt, and you're very vulnerable, not at all resilient. Then, bang, this thing hits. Unique in many ways, but not the least way being that it's a supply hit and a demand hit simultaneously. You can be simultaneously short of customers on one side and you can't get raw material at the other. Far and away the fastest rise in unemployment in history, much quicker than in the 1930s. With curlicues stretching out tentacles, if you will, out into the future, will airline travel be ever what it was? Will not a lot of us reconsider the need to make so many long tiring, infectious type journeys?

Jeremy Grantham:

We already knew we were getting the flu and the colds every second trip to Europe. Now we throw in perhaps a recurrent Coronavirus, it's quite possible. Yeah. Some industries will simply change. It's also a period of enforced introspection. What a good time but to follow up on some of the reservations we were developing about capitalism, inequality, climate change, the things the governments were not doing well. Here we get to stew and read and think, and maybe even growth at any price and to hell with the consequences, which has been the mantra of US capitalism, not always by the way, but increasingly in the last 10 years.

Jeremy Grantham:

Just as a side issue, when I got here in 1964 it turns out to have been about the sweet spot in American capitalism. Everything working pretty darn well, with the notable exception of civil rights, but in terms of respect for your workers, developing effective pension funds on their behalf, paying a decent wage, having a respectable ratio between the CEO, 40 times his average worker, and as well as Japan then, and Japan today is 40 times, and we are 300. We've gone from 40 times to 300 times your average worker for a Fortune CEO.

Jeremy Grantham:

A company today does not necessarily have a 1964 level of respect for the city it works in, the state it works in, and the country it works in. They have become kind of global enterprises trading one country off against another moving their factories and their workers where they can make the most money, and basically following on Milton Friedman's definition of social responsibility, which was the social responsibility of a corporation is to maximize profits. As I like to say, if the corporations are treated like individuals, if an individual had a policy which is to maximize my self-interest, you'd say he was a sociopath. It's a workable definition of a sociopath. Basically, we have sociopathic companies proud of that mantra. We were just beginning in the last two years to hear some pushback from that, including a lot of more respectable corporations saying, "We've gone a little too far here, guys, let's reconsider."

Jeremy Grantham:

Now we have a wonderful opportunity, don't we, to reconsider some of that? One of the side effects of the virus has been dramatically to bare down even more on the poorest quarter of workers. They not only get three quarters of the virus deaths, but they also are losing their jobs, multiples of the top quarter, who can safely work from home as I am doing here in the countryside, taking a couple of beautiful walks every day. I feel guilty, but it is part of the aggregate problem. A word on FAANGs, because of all the things that have changed since 2000, and the "This time everything is different." World, well, the FAANGs are one of my favorite examples. The FAANGs are unlike any other, they're

17.5% of the S&P. They're unlike anything that ever walked the face of the earth. They generate market cap out of thin air. Their use of assets is totally unlike, with the possible exception of a bit of Apple, unlike it used to be.

Jeremy Grantham:

It's not about traditional capital being depreciated and replaced and cranking out widgets. It's all about intellectual capital, and brand, and speed, and using your brains and innovating. Even though I'm really quite down on American capitalism as being a little fat and happy past its prime, I am very long on American venture capital. It's the really vital part of the capitalist model, and American venture capital was always the dominant one in the world, and it still is. If you look at the FAANGs to me, I'm an old guy and I've been in this business 50 years, but at GMO we hired away the potential employee number 22 from Microsoft, the oldest of the new modified group of FAANGs.

Jeremy Grantham:

They're simply not that old. They're not the Proctor and Gambles and General Electrics, and Exxon's, and Merk's that were around in The Great Depression. These are newbies and some of them very new indeed. Generally, the US venture capital industry remains vital effective. If you have a brilliant student today, he doesn't want to go and work for Goldman(?) [inaudible]. He doesn't want to be a management consultant like the 1970s. He wants to set up shop and do something new and make a difference and make a fortune doing it. Venture capital is getting all the very brightest people to go into that area. Why not? It is at least useful. It's dynamic, all the new great ideas, the change is very densely constituted in venture capital. FAANGs are somewhat an offshoot of that. They are the absolute winning, winning winners of the last 50 years of venture capital.

Jeremy Grantham:

All based on new technologies, new ideas, and they're different. My advice to everybody is be a little careful. You need a good value model that deals with intellectual capital, that deals with growth, and with quality and stability. You need to get far away from simpleminded PE and price to book when you're dealing with these guys. Maybe they're expensive, that's not what I do these days. They are not Cisco of 2000. They are not 65 times earnings. They're growing fast and they're fairly high priced, but you should be careful dismissing these guys. They are different. The downside there is maybe society is getting a little fed up with them in the sense that they don't pay much tax anywhere. They move around the globe. They exploit better than anybody the opportunities of trading off one country against another with taxes and production and complicated accounting.

Jeremy Grantham:

They are playing fairly fast and loose with political influence, some of them, and irritating particularly Europeans, but also some Americans. Maybe that will start to regress and cause them problems. I'm not touting them by any means. I'm merely pointing out that they are one of the many important differences of this cycle, of this last decade in particular, and that old fashioned routines have to be moderated.

Patrick OShaughnessy:

You mentioned that this is the fourth extraordinary stock market event of your career. I'm curious how you speak to clients, then, about your posture facing a down in the midst of it. The first three GMO famously had a very, very specific view. That view is very clearly expressed in portfolios, often very contrarian expression. What is the equivalent today? You mentioned that it's novel. Is GMOs response novel relative to those three other extraordinary events?

Jeremy Grantham:

Well, yes, our preface on the bottle of pills you're taking every morning, the warning is "This is not the near certainty that we felt in those three prior events. This has more differences. Therefore, you can't be as certain, of how this thing will play out as you could before. It's more complicated and it's less certain." Okay? That's the caveat. Now, having given you the long list of longer term problems, along the lines of climate, resource, limitations, and the longest economic cycle in history, and the highest levels of debt. Now you impose this stress on the system, and clearly the management around the world is very uneven on how they're dealing with this. This has created an almost uniquely risky environment. The uncertainties remain completely for us, but they also dominate one's portfolio and management attitude.

Jeremy Grantham:

This is not as knowable. The future is even less knowable than normal. The near certainties have disappeared. You know for sure, as I said, that this market is in the top 10% of all time PEs, and the economy, trust me, is not in the top 10%. It's in the bottom 10% of all time economies. That's a splendid mismatch carried on the broad back of the Fed. The Fed, well, we don't quite know how long and how impressive it can support stock prices, but if you're a fundamentalist and you're patient, you don't like that combination being in the highest 10% of PEs, and the lowest 10% of economic certainties. Nobody knows what's happening in the economy. We all know we're going to have a wipe out in our earnings, and we all know we're going to have a wipe out in employment, and so on. We all know it's going to go on longer than we thought.

Jeremy Grantham:

That's an interesting point, by the way. When the market hit it's low, it had a huge rally, but during that huge rally, what has come out about the economy, almost anyone with the brain is more nervous about the economy in terms of the lens of how the effect will be felt, in terms of the peak levels of earnings, setback, and unemployment. We're more pessimistic than we were at the very day the market hit this low. This is all once again carried on the broad back of paper being thrown at the system.

Patrick OShaughnessy:

I'd like to go to the almost exact opposite extreme from the intangible, heavy FAANG to a fascinating topic that you've explored for years now, which is natural resources and companies tied to those natural resources. What is the origin of your deep interest in this area? These very hard asset, very traditional, I'll call them, companies. Why do you think, one, they're important, and two, they may represent an interesting investment opportunity?

Jeremy Grantham:

Well, the long-term argument is outrageously simple and unarguable. That is, you can't have compound growth on a finite planet. I always lead very quickly, my quick demonstration. Just imagine that the Egyptian Empire which lasted for 3,000 years by the way, with the same religion, the same pharaohs, and the same culture, same language. For 3,000 years, let's just imagine for a second that its population had grown at 1% a year. The world's population has grown faster than that during my lifetime, when it just tripled. 3,000 years later, that multiplies by nine trillion times, the population of Egypt. There would be nowhere to put them on this planet or several other planets.

Jeremy Grantham:

If you do the same with physical output, a lousy 1% a year. 1% a year increase in physical outputs. You start with enough goods to fill one of the giant pyramids. You come back 3,000 years later and you've grown at one miserable percent, breaking all the economists' heart. You have enough physical goods to fill up the solar system. It doesn't take as long as you think, to compound into craziness. Doesn't take as long as you think, to start cranking out so much carbon dioxide that the surface of the planet starts to heat up.

Jeremy Grantham:

For example and just as a quick aside, the difference between the darkest glacial phase with two miles of ice on Manhattan, and the interglacial, such as we've had in the last 12,000 years that allowed civilization to get going, this rather convenient weather. The difference is 100 parts per million of carbon dioxide, from 180 parts to 280. Thank heavens, carbon dioxide is a brilliant greenhouse gas because if it went to zero, we would be a frozen ball with not much life other than microbial perhaps. It would be -15 to 25 degrees Centigrade.

Jeremy Grantham:

That first 180 gets you to the ice age. The second 100 gets you to where we were in 1850. What we've done since the Industrial Revolution is, we've gone from 280 to 410. We have added more parts per million than that which separates two miles of ice on Manhattan from today's Manhattan. I mean, this is just a shocking and amazing experiment. We're going to do the same again. We're going to add, guaranteed, no way we can avoid it, another 120 parts per million. What that will do, nobody knows for sure. It is just the same kind of huge unknowable risk that you would do anything to avoid if you were sensible.

Jeremy Grantham:

I think what we've learned since we knew the risk of climate change is that this species is not that sensible. That it just plays in short-term and ignores inconvenient long-term things, and hopes everything will work out, and that they'll be dead anyway, and screw their grandchildren apparently. It's all available science, and we choose at the government level to do quite a lot about it in a handful of enlightened governments and ignore it as a hoax in a handful of the really worst at the other end, and everything in between. We're simply underresponding as a global species, big time.

Jeremy Grantham:

We will have the temperature go up, and the floods ... The most dependable feature is that the flooding will go up, which we see everywhere, even today as we speak. We see the droughts go up, much less though, but still. The main reason the droughts go up is not because there's less rain, which there isn't. It's because the temperature's gone up, and so it evaporates the available rain and produces a California situation more often. Now as it turns out, for a technical, regional reasons, there is a long-term profound drought in the Southeast, which there might have been anyway, but the higher temperatures are just making it much worse.

Jeremy Grantham:

Anyway, that's a digression which I can never resist, since we've spent all our money attempting to propagandize and communicate the problems of climate change. We invest our portfolio in green technology, to try and do something about it, not as philanthropy by the way, but as purely sensible defensive behavior on the part of a family to look after its grandchildren and their grandchildren. To go, you may have to repeat the original question which was on resources. Okay.

Jeremy Grantham:

You can't have compound growth on a finite world. Very quickly, you start to run out of this, that, and the other. When I grew up we had a coal fire. Since we were kind of middle class, the coal we afforded was anthracite which is denser than oil, it's relatively clean, hasn't got much dust. Black shiny stuff they now use for jewelry sometimes. It's gone. It was burned enough in our North Country, England fireplace in 1944 and it's now disappeared. It's all been used up. It happens. Most of the high-quality coal in the UK which drove the Industrial Revolution has gone. The same in Germany. Their high-grade coal has simply disappeared.

Jeremy Grantham:

You develop the cheapest, shallowest, thickest ore mines first, and every succeeding mine has lower quality ore. The copper mines today have 10% of the ore that you could find in 1900. It continues as far as the eye can see. Each generation of mines is lower quality. In the case of oil, a deeper, and offshore, and more technical. In the case of fracking, you've had to develop ways of using energy to squeeze the solid rock into giving up its oil. That's the way it always goes, until eventually the cost and the energy cost of getting that low-grade copper ore from a deeper and deeper mine, and shipping it around in these trucks where the wheels are bigger than a house, is simply too energy-intensive.

Jeremy Grantham:

What we notice is that technology overcame this increasing embedded inefficiency of using the best first. Up until about 2000, the price of everything went down. The marginal increase in cost would push it up a couple of percent, but the technology would drive it down by 4%, and it would net out at something close to a 2% decline for 100 years, ending in 2000. Over the 100 years, the price of the average commodity dropped 7%. Pretty amazing help to getting rich.

Jeremy Grantham:

Then we began to hit the transition phase where the sheer limits began to hit up against the technology. Now you have the same 4% technology, but now you have a 4% increasing cost. That bouncing around at some going up, some going down, some going sideways. That downward trend from 1900 to 2000 is simply broken. Oil of course, we can come to as a separate issue and a very interesting, special case. The other day, before the virus, the price had spent a few years between 80 and 60. The average price back in the late 1990s, it got down to 16 in normal conditions too.

Jeremy Grantham:

We had broken out in the price of oil. Oil is half the value of all commodities traded. That had passed the inflation point, and the long-term decline driven by technology had been replaced by growing shortages and a much higher percentage of oil coming from deep offshore, expensive wells. No longer discovering the giant fields of the 1940s and '50s, and in the Gulf where you'd put a hole in the ground and it bubbles up for 80 years, and it costs you in those days, 10 cents a barrel to pump it. Today, maybe two bucks a barrel, but it's nothing.

Jeremy Grantham:

Anyway, outside that, if you take a list of the rarer metals, there's a lot of iron, there's a lot of aluminum. 8% of the earth's crust is aluminum, and four and a half percent is iron ore. Then you get down, there's a huge drop off and suddenly you get a list. If you add nickel, and copper, and tin, and lead, and zinc, and molybdenum, and gold, and silver, and platinum, palladium, and four others together, they are much less than .1. They are some, almost unbelievably tiny fraction of the amount of iron ore.

Jeremy Grantham:

In general, you don't want to worry about iron ore and aluminium, but you want to really worry about all of those other metals that we need in our high-tech world. They are all beginning to run out. They're all have supply pressure on them. What's going to happen is, you get into a shortage, the price will triple, quadruple of, say cobalt. People will redesign everything, and substitute it, and open new plants and new mines. Then the price will come down, but it will bounce up into others, and the price of nickel will go through the roof and so on. We will just have a pattern from now on for a while where the best description of commodities is that they will go up and down. The downward trend of 100 years will clearly have disappeared. I think that is the case since 2000, in my opinion.

Jeremy Grantham:

Then, starting anytime soon, we enter the endgame when the average price of the average commodity including food, starts to go up as diminishing returns, finally, gets the better of technology. There are

signs of that, here, there, and everywhere, again, in my opinion. It's a long-term idea. You never know over any given few years, what will happen to any given metal or any given commodity.

Jeremy Grantham:

Oil is of course, a super special case, hugely important. Fracking completely changed the world's supply/demand balance for a handful of years. The U.S., out of nowhere, started to add over a million barrels a day. The world's total is 100. On the margin, a million or two goes a long way to go from excess or oil deficit. The U.S. quickly added, over six years, six million barrels a day, without which the price of oil would be way over 100, exing out a virus, and it would be a different world.

Jeremy Grantham:

However, in the long run there isn't that much fracking oil. Probably outside two and a half years' worth of global supply, which you can hear, doesn't sound that impressive. When you take it, and you ramp it up quickly, and you throw it into the market with no price control, no control at all, no Texas Railroad Commission telling you what to do, like the '30s, '40s, and '50s, and '60s, exercising some sort of discipline. You just crank it out as fast as you can, slap it into the market, but it's only two and a half years' worth. You run through your highest, best fracking resources pretty darn quickly. Another couple of years and we would be plateauing in all probability.

Jeremy Grantham:

It was wonderfully helpful to the U.S. You can back out fracking and say, it might have been at least half of the difference between us and Europe. We have handsomely amplified in economics in the last 10 years. Europe, which has had a rather dismal 10 years. Half of that has been the amazing effect of fracking in several states, but mainly of course, Texas and North Dakota. Also, Pennsylvania and couple of others, New Mexico.

Patrick OShaughnessy:

There's a chart in the paper you wrote on this topic which is incredibly stark, which shows the relative discount of energy and metals companies versus just a broad S&P 500. Historically, there has been an average discount of about 20%. It's not unusual for these companies to trade at lower valuations, higher yields, et cetera. Today, that same number is 80%. We're talking about a historic, historic discount, all the way back to the early 1900s, of these types of companies.

Patrick OShaughnessy:

It sounds like the opposite story of what you described earlier where we've got top 10% PE, bottom 10% economic conditions. I think what you're saying here from an investment standpoint is, we've got bottom 1% of relative discount, but a good argument for strong fundamental improvement from here. Is that well summed up?

Jeremy Grantham:

Unfortunately, you have to divide commodities into three groups, oils, metals, and food. For metals, that is absolutely my view. A long-term argument is very favorable to higher prices or decent prices, and the discounts are typically extreme. In food, there is a long-term squeeze on food supply demand relationships, and their productivity gains are dwindling. The population, although it's slowing, is still growing rapidly. The growth rate is slowing, but we're still growing over 1% a year in global population. We're having a very hard time keeping the productivity of grains at 1% a year.

Jeremy Grantham:

We're in a real horse race between population growth and our ability to squeeze out more. Under the surface, hah sorry, - a pun - we are eroding our soils and beginning to, long-term, damage the productivity of agriculture. It is said there are only 70 good product years left at best, and in places that we are already showing the downside of having worn away through sloppy agricultural practices, and

over years, of our arable land. All over the world, that has gone on. The carbon content of the soils in the U.S. has come down from about 6% in the Midwest to about one and a half. The activity level, the ability to soak up water is a small fraction of what it was, at a time when the floods are coming as they are right now. Far too often and much heavier downpours than we had ever seen before. They're the ones that cause erosion, but they also are the ones that need high-quality soil to soak up the water.

Jeremy Grantham:

That is a direct function of the carbon content, the biological matter in the soil which we know, Big Ag, modern techniques have been eating away. In many cases, killing off with toxic pesticides, which is another topic we could get into, because those toxic pesticides have been doing a terrible job on killing off all the insects on the planet, which are down arguably, and no one can agree on the numbers. It's a very difficult topic to fix on, but here and there, they're down 75%. In other places they're down only 25%.

Jeremy Grantham:

Without insects, you get into real trouble, the birds, and so on, and everything else, and the creatures of the ground don't have them to feed on. Much more immediate than that, the pesticides in fact, does. The chemical levels in our bodies have gone through the roof to such an effect that among other things, our fertility rate is affected. I wrote a paper, rather surprisingly I suppose, for my job description that included a description of how our sperm count in the developed world has dropped to a third of what it was. It's about 40 units down from 120. It continues to drop at almost 2% a year.

Jeremy Grantham:

The leading epidemiologists say it shows no sign of decelerating yet. What that means is, in 25 years, the average young couple is going to need help, in the U.S. 20 years ago, only a handful of people.

Jeremy Grantham:

It wasn't a topic, but today you'll bump into it, if you try, because 10, 15% of young couples already have trouble. These things are moving faster than climate change. We will do nothing about it because we put the value, the intellectual property values of the corporations are so high, that where they act and ban the chemicals in Europe, we do not. There they say if there's a reasonable doubt, they have to prove they're safe. Here we say, if there's reasonable doubt, the benefit of the doubt goes to the corporation, which is an odd choice. To put the intellectual capital of Bayer and Monsanto ahead of your sperm count. In the end, that's what we do.

Patrick OShaughnessy:

It sounds as though from an investment perspective, the metals case is maybe the most clear cut around this from... Meaning the most clear cut potential investment opportunity. Food is sort of rife with all these interesting issues. Then oil, we've talked about a bit, but, I guess, to sum up your point, you have to view these three categories separately. You're not making a case for all commodities, but rather urging investors to consider all three categories.

Jeremy Grantham:

I'm making a case for the metals, but ignore iron ore and aluminum. All of the interesting nickels and tins, I'm making a case for them, and making a case for good farming. The ability, the opportunity exists to get into farming almost anywhere in the world and do it in a more sustainable regenerative way where you improve the soil, and the carbon content, and the ability to absorb and store water, and to have wonderful microbial life. The quality, the nutrient value of the food goes up. The toxicity goes down, because you need much less in the way of pesticides, so that is a win-win and the farmers can make more money. It's beginning to get a lot of traction, but from a very low base, but that would be a great investment opportunity. There's a lot of green technology around that area that we do

considerable investing in, in our foundation. Yes, we do try and make money, but it all goes back to fighting the cause for good agriculture and climate change.

Jeremy Grantham:

Good farming has a lot of interrelationships with climate change. Done correctly it really helps. Then the third one, as you say, is oil, and oil is a very interesting special case, because we are hitting the threshold now that people don't quite realize, where the electric car is going to become, in the next two, three years, cheaper to build, as well as to run, which it is today. It's cheaper to run today. It's cheaper to maintain today. It has 15% moving parts. As a proud owner of a Tesla Model 3, it is beautiful to drive. Trust me. It's not dirty, and it's quiet as a mouse, but it was expensive. As the cost of battery, which dominates the equation comes down, that changes rapidly.

Jeremy Grantham:

In 2010, the other day, a Tesla needed a $1,000 a kilowatt hour. This year, probably 130, and if it's not, it may be 120, but the next generation of battery, which they're introducing and talking about quietly in their odd way, is going to knock that down to below 100. Below 100, you become as cheap as a regular car, and their battery's in five years will be 50 or better, or less. They will be absolutely the default transportation. The Tesla in China they're offering, if you pay up, gives you 400 miles. I paid up on the version a year ago, and I got 300 miles, so it's a bit irritating, but somewhere between three, 400. The new batteries will do 500 in two or three years, and they'll last a million miles, by the way, so that you'll be able to recycle car batteries to help out the electric grid.

Jeremy Grantham:

Transportation is done. Transportation is a very big chunk of oil use, so this is now a terrific horse race between the speed and the capital needed, and the supply system to deliver the electricity to electric cars. Between that going on, which chews up a lot of money and so on, on the one hand and the demand for oil on the other, it could well be that oil will peak as late as three or four years from now, if the transition is slow, but it could have peaked. We might come out of this virus phase and never see a higher oil demand level than we have seen. Peak oil will turn out as many thought to be peak demand rather than peak supply, but either way, it's a special case and watch your tech in terms of demand. Now, having said that, about 10 years ago, the S&P was made up of 16% oil, today it's three.

Jeremy Grantham:

You won't get rich shorting traditional oil stocks from here. They have just been crushed, and crushed, and re-crushed, as has the price of oil. It's the kind of, you could argue on the ethics of owning oil, but it's been a diabolically bad, probably as bad a major group, one of the 10 great groups of the S&P, probably as bad a drop in relative performance as has ever occurred in the decade in the S&P.

Patrick OShaughnessy:

I have to say, I must characterize, the things that I would call your sort of long portfolio, as refreshingly diverse and unique. We've talked about the opportunity in farming, in a certain type of farming, in a certain type of metals. You've talked about the benefits of what I would call technology entrepreneurship. The U.S. having a keen advantage in something like venture capital, which has led to these enormous corporate success stories, and then we've also talked a lot about all the things that are a little bit scary about the world.

Patrick OShaughnessy:

I'm curious, sort of, where you think we go from here? What do you not understand well, right now, that you wish you did? Where are you going to be spending your time as you think about the future?

Jeremy Grantham:

Let me just add to that, that the Grantham Foundation has 60% in venture capital, if you can believe that.

Patrick OShaughnessy:

Mm-hmm (affirmative). Fascinating.

Jeremy Grantham:

Our target is 70, and we see the most amazing, and interesting, and dynamic opportunities. And green tech is one of the most exciting of all of them, but there are plenty of other areas of venture, which is also very exciting, and how it will be treated and handled in the virus economy, the Lord alone knows, but there should be lots of opportunities for those of your listeners who can take advantage of venture capital opportunities. There will be some interesting, cheaper opportunities than normal.

Jeremy Grantham:

Sorry, I couldn't resist that and it's put me off.

Patrick OShaughnessy:

Absolutely. First of all, I think it's fascinating, the strength of that allocation. The question is more around thinking through the future. What do you not understand well that you wish you did, or asked differently? Where are you trying to run up a learning curve today?

Jeremy Grantham:

I am focusing on the intersection of the virus, the economy, and the stock market. Okay? This is kind of what I do, and what you find is, the seams between specialties are where the opportunities are, and where the ignorance is. You can have, even in hard science, you go to the boundary of one person's expertise and the next one, and there's a gap. When we study agriculture we find the soil scientists know about erosion, and the climate scientists know about other damage and heavy floods, but they don't know about the other person's work, and so we know more about erosion when we talk to climate scientists, giving their views on agriculture, then they do. You think, "How is this possible, they're a scientist in this general field? But it is possible, it happens everywhere.

Jeremy Grantham:

So what happened in the virus problem, is you had virologists, very confident, they know more than everybody else. They know, they know more than everybody else, but they know nothing about economics, and they were stomping all over the economists. Then you have economists who know nothing about virology, or medical systems, and you have people in the medical system who understands the spread of diseases and all of these things, and they know nothing about economics or sociology. The economists know a little bit about sociology, but the medical world knows very little, and then crowd psychology and politics, and you put them all together in the mess. What we've ended up, for a while, was a world in which the medical people ruled the roost. This was not a medical problem alone, but this was an elaborate tradeoff between medical consequences and the cost of addressing them.

Jeremy Grantham:

You needed to put together a brains trust of a handful of experts, medical experts, a handful of economist experts, a few social experts, and a few people with common sense, and sit down, not let them out of the room, kind of FDR style, until they have agonized through the sensible tradeoffs of cost and consequences. We didn't do that. We got into kind of pap of, "Oh, you can't put a price on life." Nonsense. We put a price on life all the time. By not having universal health care, you're putting a price on life. It's too expensive to do that. It's done all the time.

Jeremy Grantham:

The idea that you could stop the entire economic system without consequences to save a life, a single life is of course, crazy. Everyone knows that, so now you start drawing the boundary. Where is the effect of trade off? Is it in the Swedish model, the German model, the New Zealand model. There's a variable floating along with that too, which is just competence. The competence covers how aggressively you attack a problem, how fast you attack it as well. Regrettably, some of the big countries have had very low levels of competence, and some of the countries out east, including New Zealand, Australia, along with Taiwan, Singapore, Hong Kong, China, South Korea, Vietnam, have done brilliantly, brilliantly better.

Jeremy Grantham:

We give a passing grade, maybe, to Germany and we hold it up as doing a good example, that's a quarter of the deaths say of the Brits, much less than the U.S., but those that I just mentioned are better than 10 times better than Germany.

Jeremy Grantham:

How is it possible to have your standard of competence be 10 times worse in deaths? Taiwan didn't have an unfair start over the Germany. Quite the reverse. It was right next to China, is arguably part of China, and outside Hubei Province, they did much better than 10 times better than Germany also. In a country with 1.3 billion people outside that province, and they had less than, maybe a 20th of the death rate of Germany, which had half of the U.S., and a third of the Brits. It's very painful to be a Brit or a Massachusettian. Massachusetts actually has more deaths per capita than Britain, which is a contender for worst.

Jeremy Grantham:

Unlike BS, this is a grade, every country comes with a grade. They all started in a fair fight. They all had the same information about the same time, and some locked down quickly, effectively, tested, traced, or had cultural cleanliness and distance customs like Japan, which again, I forgot Japan. Japan is a 10th as bad as Germany, and never had full lockdown and is going to have less economic consequences than the heavy lockdown countries and hardly any of the deaths. What an amazing opportunity to be efficient, and yet Massachusetts, New York, they talk a good game, but the numbers speak for themselves, and the UK, all terrible beyond belief, incompetent. It's the only explanation, moved too slowly and not effectively when they moved, so pay a very high economic price for dismal medical results.

Patrick OShaughnessy:

I'd be curious what advice you would have for younger people interested in the field of investing, given all that you've learned across the span of your career, and knowing as much as you do about the current economic business investing landscape. What advice would you give a twentysomething that is interested in this field?

Jeremy Grantham:

I get asked that in real life, and my honest answer is go into venture capital. It gives you the same opportunity to use your brains, and your research, your analysis, but it's more opportunity to use your imagination and to mix with people who are trying to change the world for the better, and it is useful. Private equity and regular investing is shuffling shares between one player and another. It doesn't change anything. I sell a share, you buy it, who cares? Venture capital is, you're taking new money away from something else, and you're putting it in to a new idea. You're building a plant, small maybe, that would not have been built without your money. You're working on research that would not have been done. You're producing products that would not have been produced. You are changing the world, and as it turns out, you are, in the end, going to be producing the next generation of FAANGs, and the great companies perhaps. It's an opportunity.

Patrick OShaughnessy:

I love that answer.
Jeremy Grantham:

Yeah, no, that's a nice, simple answer.

Patrick OShaughnessy:

I love it.
Jeremy Grantham:

It turns a bureaucratic job into a job that really makes a difference.

Patrick OShaughnessy:

Jeremy, my closing question for everybody, is to ask for the kindest thing that anyone's ever done for you.
Jeremy Grantham:

One or two people have said very, such kind things about me that you think, "Well, that's unjustifiable, that's ridiculous." I would think of those. I used to be an avid reader of one person who wrote for Barron's, and did the lead, the intro for 40 years. Had a very kind of flowery entertaining, occasionally jokey, occasionally very serious style, and I'm blocking his name, of course. I'm only amazed I haven't had more blocks by now, but everyone used to know him, because a lot of us used to buy Barron's really only for this guy, he was so good, at the front. He died sadly five years ago. In his classic style, in his intro, and of course, getting in his intro, in Barron's was always a very big deal, and he kept his eye on my quarterly letters. But just kind of apropos of nothing, one week, he says, "In the world of mountebanks and scoundrels, Jeremy is the model of virtue." Now, what do you say to that?

Patrick OShaughnessy:

It's a wonderful comment, and it's something I think we can all aspire to in this business. First of all, I would almost couple your last two answers in an interesting way, the idea on venture capital being fundamentally creative versus a positive sum, instead of zero sum, maybe that's a fair summary, and our whole conversation really has that tint to it. I just want to say thank you for joining me, for all your time, for all the insight, and a very unique conversation. Thank you, Jeremy.
Jeremy Grantham:

It's been a complete pleasure, by the way, and the guy's name was Alan Abelson.

Patrick OShaughnessy:

There you go. Fantastic.
Jeremy Grantham:

Okay. Bye now.

Patrick OShaughnessy:

Well, we close on a good spot. Thank you.