

FRMO Corporation Annual Meeting of Shareholders
Wednesday, September 12, 2018

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Thérèse Byars – Corporate Secretary

Welcome to the 2018 FRMO Annual Meeting of Shareholders. My name is Thérèse Byars, and I'm the corporate secretary of the company. Joining me are Murray Stahl, Chairman and Chief Executive Officer, and Steven Bregman, President and Chief Financial Officer.

The FRMO Annual and Quarterly Reports can be found on our website at frmocorp.com. A summary transcript of today's meeting will be posted on our website in the coming weeks.

And now, I would like to present the seven directors, all of whom are candidates for reelection. They are: Murray Stahl, Steven Bregman, Peter Doyle, Lawrence J. Goldstein, Lester J. Tanner, Allan Kornfeld, and J.P. Hirschson. Also present today from our auditors, Baker Tilly Virchow Krause, is FRMO's audit manager, Patrick Warch.

We now proceed to the report on the tabulation of the proxies for the two proposals. The proxy committee, appointed by the FRMO Board of Directors, is here this afternoon to represent those shareholders who gave their proxies to the committee. Notice of this meeting and proxy materials were sent to shareholders of record as of July 25, 2018. The inspectors of election report that proxies were received from FRMO shareholders holding approximately 38 million shares of common stock, or 86% of the over 43.9 million total shares of common stock entitled to vote. Therefore, this meeting is properly organized, with a quorum present, and we may proceed.

There are two items of business for this meeting. The first is the election of the seven directors, who were nominated in accordance with the company's governing documents. The second item of business is the proposal to ratify the appointment of Baker Tilly Virchow Krause LLP as the independent registered public accounting firm of the company for the fiscal year ending May 31, 2019. The board recommends a vote "for" on both items.

Based on the preliminary report of the inspectors of election, all seven director nominees have been elected to the board, with all nominees receiving at least 99% of the votes cast and 86% of the shares outstanding. The proposal to ratify the appointment of Baker Tilly Virchow Krause LLP as the independent registered public accounting firm of the company for the fiscal year ending May 31, 2019 has been approved, with approximately 99% of the votes cast and 86% of the shares outstanding. This completes our formal business.

The next item on the agenda is the Chairman's Report to the Shareholders. Mr. Stahl will review key points related to the 2018 financial results. When he has finished his remarks, he and Mr. Bregman will answer questions. At that time, if you have a question, please raise your hand. Please

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limit your questions to matters that are of general interest to shareholders. And, with that, I'll turn the meeting over to the Chairman of the Board, Mr. Murray Stahl.

Murray Stahl – Chairman & Chief Executive Officer

Thank you, Thérèse. And thanks everybody for being here. In the annual letter, I told you what we were doing. At this meeting, I thought I'd supplement the annual letter by telling you why we're doing it because, even though we alluded to it in the letter, we didn't really go into a great amount of detail.

Let's start with the overall environment. These are minor points, but it just sets the tone. In terms of investment opportunities generally, in my opinion, we have the highest valuations today we've ever had in the history of valuations. That's a generalization, but I think it's true. If you go back a century or more, you'll see that the price-to-earnings ratios, the price-to-book-value ratios, dividend yields, or any of the standard metrics are the highest ever. As a result, the opportunity set is necessarily smaller than it was historically.

We also have very low interest rates, which affects valuations. If interest rates were to rise, valuations would decline. We all have to be mindful of that. That's one of the risks out there, and it's one of the reasons we have a lot of cash on the balance sheet.

But it's not merely that. There's a lot more going on, apart from valuation. I'll just pick two items and then I'll expand on them, so you can get a sense for what concerns us, and everything that concerns us is ultimately an opportunity.

I mentioned interest rates. If you look at all the debt in the U.S.—everything from a car loan to a United States Treasury Bond—everything—the sum total of that is \$71.1 trillion. That's how much, collectively, all Americans owe to a counterparty.

For the purposes of this conversation, let's make believe that interest rates go up 1 percentage point—just 1. That's 100 basis points. I only pick that figure because it's such an easy number to work with, and it's within the range of agreement. I think everybody in the room would admit that it's readily conceivable that interest rates could rise in a year or two by 1 percentage point. I don't think anybody would challenge that notion. It's certainly not controversial. By historical standards, it's fairly common to see interest rate increases of that magnitude.

Since 1% of \$71-plus trillion is \$711 billion, if interest rates were to increase by 1%, for a \$20 trillion economy such as America's, that would mean spending another \$711 billion in interest expense. Actually, it would be worse than that because that \$71.1 trillion debt is growing every day. But, leaving that question aside, \$711 billion is such a large number that it becomes abstract; it becomes meaningless to us, so let's make it more tangible.

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If collectively all the U.S. citizens had to spend \$711 billion on increased debt service, that would be the equivalent of what it would cost the country if oil prices went to \$163 a barrel. A 100-basis point increase in rates is the mathematical equivalent of an oil shock of \$163 a barrel. How did I arrive at that number? Look at the U.S. oil consumption per day and multiply it by 365. Then multiply that figure by the price of oil. Once you have that number, you just extrapolate to find what the required oil price would be and, give or take a few pennies, it amounts to \$163 a barrel.

That's what happens when you try to grow an economy using debt. In the post-World War II world, debt has been the standard way of growing an economy. That's a risk out there, and we all need to be mindful of it. It doesn't mean that rates will increase by 100 basis points. It might not happen. And it doesn't mean that, if it does happen, the country can't somehow manage. Maybe it can. But we have to be mindful of it as a possibility, and that requires planning in advance.

Just to show you what the possibilities are, let's talk about a totally different scenario. I can go on and on like this; I won't, because it would be too depressing. I'll talk about positive things.

YouTube and Netflix are two companies that most everyone knows about and uses their service. I think it's likely that on a normal day, YouTube and Netflix together use 52% of the available internet bandwidth in the U.S. That's a big number, and that's just two companies. How are they able to do that? Theoretically that should cost a lot of money; yet, you won't find internet service expense as a line item on the Netflix financial statement, nor will you find an internet service charge on the Google financial statement, because we have something in America called net neutrality. What does net neutrality mean in layman's terms? It means that anybody and everybody can use the bandwidth for whatever purpose and to whatever degree they wish to use it, irrespective of the quantity they use.

Imagine that there was an enormous corporation that wanted to use a lot of electric power. Would anybody say it's reasonable—this is a rhetorical question, not an actual question—would anybody say it's reasonable that a huge corporation manufacturing something, let's say oil products, or steel, could use an enormous amount of electric power and that the bill should be equivalent to what the average household pays for electric power? That's not the way electric power is regulated in U.S., but that is the way the internet is regulated.

What if that changed? I have no insight into whether or not it would change or, if it were, in what manner it would change, or what would be the catalyst for making it change. I just put it out as an observation, and we have to be mindful of that. We have to be mindful of that possibility, because that's one of the risks we have to live with if we buy an index.

I can't resist talking about indexes, and most of you know that I write ad nauseam about them. I personally think they're a danger. Indexation is also a challenge to the investment management business. Recently, Fidelity and JPMorgan Chase issued no-fee indexes. So now, if you're in the investment management business, you have to compete with these companies that don't charge a fee. It's not actually a very good development in the world of investment management.

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But, leaving that question aside, let's take a stock in the S&P 500 index. Let's use Amazon, just as an example. I have nothing against it; I have no axe to grind about it. I use the service myself. It currently has about a 3.5% weight in the index. How do they arrive at that weight? They arrive at it by taking what's called the float, which is comprised of the shares available to be sold on any given day, which means taking the total shares outstanding, less those owned by management, and management owns about 15%. That's not an exact number but, for our purposes, it's close enough. That leaves 85% in the float. That float-adjusted market capitalization, relative to all the other stocks in the index, is how they arrive at a 3.45% weight. That's in relation to the total sum of all the other float-adjusted numbers.

But I wonder if it is accurate to consider the index fund shares as part of the float, because I have a problem with that. My problem with it is that as a manager, if I owned Amazon, I might sell it on any given day. I don't own Amazon, but if I wanted to, I could buy it on any day and then sell it whenever I wish, maybe because the price or valuation rose sufficiently to satisfy me. An index fund, however, will only sell on the condition that it has negative cash flow. As long as the index has positive cash inflows, it will be a buyer, and cannot be a seller. Therefore, if the indexes are getting money, which they are, I don't believe it's methodologically correct to say that the float of Amazon is 85% of the shares outstanding. I think it's 85% of the shares outstanding, less those shares that happen to be owned by indexes.

How do you resolve this problem? You can see where the problem would be, because the index will buy if it gets cash flow, irrespective of the price. The Amazon share valuation is very high, and now you know why. How could you limit this?

I wouldn't want to assert this as a policy prescription, but I could say: "Well, the real float of Amazon is a fraction of what they say the float is, because in the float calculation, you have to exclude the shares owned by the index." Is that a solution to the problem? Obviously not. Why not? Because you would have to do the same for every other stock in the index, which is all of them. The only way to solve that problem would be to have a finite limit on the amount of money that could be indexed. But who would promulgate the finite limit? And, if they were to, what would that finite limit be? It's a problem.

Those are the issues that one needs to contend with. You could look at it as having a glass that is half-empty or a glass that is half-full. In our reckoning, the glass is half-full because, even though the opportunity set has diminished, that doesn't mean there are no opportunities. I believe we have found a few over the years, and they have helped us to attain a balance sheet that I think is greater than at any time in the history of the company.

But the fundamental problem of investment management is not changed by the fact that we find a couple of good stocks because, if the fees contract, we have to go to other places that offer other opportunities where we can at least get paid for what we do. One area that we have been exploring is the concept of cryptocurrency. I'm sure it's weighing on your minds: What is our cryptocurrency exposure? Why aren't we out? Why are we not diminishing but, rather, are actually increasing our exposure, in a manner I'll describe in a second?

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We could be wrong regarding this investment, because it's very controversial and we're certainly in a minority, but cryptocurrency is something that we believe will be a major asset class in the foreseeable future. Therefore, we think it's important to develop expertise in this area. We have two basic arms of our cryptocurrency business. One is that we create funds, and we buy cryptocurrencies. The other is that we mine cryptocurrencies. Now, cryptocurrencies are volatile, and they go up and they go down. When they go up, people glory in how far they went up; when they go down, people are very depressed.

Let me take just a couple of minutes to explain why cryptocurrencies are volatile—what makes them go up and down. It's a digression, but I think it's a worthy digression. I don't want you to get the impression that the volatility is caused just by crazy people who are speculating on something that has no intrinsic value. While cryptocurrencies may have no intrinsic value, there are economic factors to cryptocurrencies that are really what makes them go up and down.

Like any product, even if cryptocurrencies have no intrinsic value, they do have a cost of production. Using bitcoin as an example, a cryptocurrency should not fall below its cost of production. Its cost of production could fall, but bitcoin's price should not fall below its cost of production. Why? Because, in order to make a cryptocurrency work, you have to have something called a distributed network. A distributed network is something in which anybody can participate. You probably won't want to do it, but anybody could be part of that network if they so desire. I'll describe the virtues of participating in a couple of minutes.

As long as we can produce a bitcoin more cheaply than it costs to buy a bitcoin on the market, there will be a distributed network—simply because there will be some people who are attracted to the profit possibilities. If the price of bitcoin falls below that amount, then either the cost of production would fall, or there would be no network and no bitcoin, or any other cryptocurrency, because why would anyone continue to commit capital and expense to mine—which is what supports the network—at a loss?

In terms of the cost of production, what do you need to mine a bitcoin? You need a server that works to solve a certain algorithm. This computer is specifically designed to solve a certain algorithm, and only that algorithm. To give you an idea of what's happened since the end of December last year, if I wanted to buy such a server at that time, it would have cost about \$3,000. And with that, I would have had to buy a power supply unit, which costs \$150, for a total cost of \$3,150. The other day, I believe it was Thursday of last week, the last time I looked, the same server cost \$473, and that includes the \$150 power supply although, of course, the current cost of a power supply would be less than \$150.

This is an example of Moore's Law in action. But even that is not comparable, because the machine I looked at is a 14-terahash machine. At the end of December, I would've bought a 13.5-terahash machine. So, the newer machine has more processing power. To make the price more equivalent, you would divide \$473 by 1.03 or some such figure, because you'd be getting 3%-plus more

processing power. Then take away another, I don't know, \$14, or \$13 for the power supply unit to have a comparable price that is roughly \$460.

Viewed in that dimension, the cost of production, at least as far as the machine is concerned, is down by 80-some-odd percent. In most instances, though not all, when the cost of production falls, the savings are passed on to the customers. However, that is equilibrated by a difficulty rating, another term I have to introduce—pardon me for introducing these terms; you don't have to remember them. The important thing to remember is that there are these practical financial vectors, or dynamics, that cause the price to fluctuate.

The difficulty rating is how much processing power is needed to create a bitcoin—also known as mining. The higher the difficulty rating, the harder it is to mine a bitcoin, meaning the more servers you have to buy and the more electric power you have to use. Electric power, in the form of server hosting fees, is one of the inputs needed.

The difficulty rating is up a lot since the end of December 2017. So, while we have one dynamic, the cost of the mining equipment—servers—that has declined, the other dynamic, the difficulty rating, is up. The two don't equilibrate because, in simplistic terms, the cost of the server is down more than the difficulty rating is up, which means that the price of bitcoin is down. There are some economies that can be had in hosting services, and I'll talk about that in a minute. If you do that math, you'll get to more or less where the current cryptocurrency price is right now.

Ultimately, there will be a finite limit to how cheap a server can be. The cheaper the servers are, the more cryptocurrency servers that will be used, because people will buy them. I won't go into what the mining schedule is, because it's too confusing. But it's not that they will make more cryptocurrency; rather, there will be more people competing to make it. You'll get less from every machine, but you'll have more machines. Ultimately, the difficulty rating will overwhelm any decline in the cost of the machines or any decline in the cost of hosting, and the price of the cryptocurrency will go up.

Why do we even need a cryptocurrency? I included a little of this discussion in the shareholder letter, and I'll expand on it now. Because the systems today for finance are not secure, there are just an untold number of attack topologies, meaning there are many ways to hack into the existing financial systems. But the cryptocurrency systems have never been hacked. They're more secure. For that reason alone, the world has to move to cryptocurrency. Maybe they don't want to, but they must.

Even if you don't know a lot about cryptocurrency, you might well ask why they can't just take the cryptocurrency algorithms in the form of the blockchain, which is the supporting technology, and just use it for tracking dollars. We have electronic dollars; we wire money electronically; we have Visa cards and MasterCard. We have electronic banking. Why can't we use the blockchain for dollars? You can, but it just won't be secure. Why won't it be secure for dollars if it is secure for bitcoin? Because you would have nothing to reconcile against. You must be able to know, with

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absolute certainty, at any point in time, how many coins are in the system; that's a critical protection against double-spending or counterfeiting.

In the modern world, money is created via the banking system. When I walk into a bank and get a Visa card, and I charge a thousand dollars, they don't reach into the vault and pull out a thousand dollars. They create an electronic banking account for me. Somebody could have done that with a hack; in theory, it happens every day. Now there's money in the system that really doesn't belong there. Unless you know with certainty how much money there is in the system, a blockchain will never do anything for you.

I believe we will have, before very many months expire, a vast movement forward in the world of cryptocurrency. I also think that the media doesn't cover it as well as it should, so I'll just give you some recent news items. I wonder how many people have heard about these developments.

On Monday this week, Canada launched a bitcoin mutual fund called First Block Capital. I'm not telling you to go out and buy it; I mention it because, if Canada has it, it's reasonable to believe that they solved the various problems of custody and security. The U.S. will solve those problems or, if not, we will just use whatever the Canadians use. Obviously, solving the custody problem could radically affect the demand for cryptocurrency.

A week and a half ago, the Bank of America filed a patent for cryptocurrency custody. A lot of work goes into the process of filing a patent. The filer must take it seriously. Citigroup is taking a different approach. I believe Citigroup is the largest custodian of ADRs, American depository receipts for foreign securities, and it is developing something called DARs for digital asset receipts. It's like an ADR. They're using their existing technology to custody cryptocurrency, because they see a lot of demand for it developing.

Northern Trust is working on a related project. There are many different entities working on cryptocurrency custody of an institutional grade. It will be here before very long. I believe in December, the Intercontinental Exchange will have a physical—not a cash-settled, but a physical—bitcoin future. To have a physical future, there must be a way of storing it, so they would have to collect it in coins. I believe all these projects are coming together and, when they do, we'll be in a crypto world.

Apart from the security and cybersecurity aspects, why do we need cryptocurrency? Because our money is being debased. When you buy a Treasury bond of 10 years, let's say, that yields 2.96%, or whatever it yields. After you pay your taxes, you have perhaps, I don't know, 1.7%-odd left. It's less than the inflation rate. You're getting debased. And that's not a good thing for investors. I presume that investors who want their savings or capital to be in bonds do not want to be debased.

For all those reasons, I think cryptocurrency is very important; it's a major asset class. And, by the way, even from the point of view of the large index funds, in their more self-interested incarnation, if I may be permitted to talk about that, the typical index fund has to compete with now two index fund efforts, the Fidelity effort and the JPMorgan Chase effort, at zero-fee. What is the point of

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collecting billions, perhaps even \$1 trillion of assets under management, to earn no fee? Crypto is something they can charge fees on. Obviously, that's the impetus; that's the motivation.

What have we done at Horizon Kinetics and FRMO? We've done a couple of things. One is that we created some entities in which we own various cryptocurrencies, and we charge a certain fee. Another is that we created some mining entities. The first cryptocurrency mining fund was offered with no fee, and now we're in the process of creating another one. The new one will have a fee because, after all, we have to make some money, too, or why would you be here?

In the cryptocurrency mining area, we've we made a couple of different efforts. Horizon Kinetics itself, of which FRMO owns almost 5%, invested \$500,000 to own 9.09% of a hosting company. Why did we do that? Two reasons: one is to get a discount on our hosting fees. We want to lock in a lower price. That discount will apply to the existing entity and the new one we're about to close on. We're also investing about \$250,000 in yet a second hosting company. We make these investments not merely to get discounts, but also because we just want to learn more about hosting. Everybody in the world of crypto is in education mode. We learn more about it every day. Different people, depending on their orientation, know different things. It's important to be as up-to-date as we possibly can.

Basically, if you bought a server today for \$473—if it's still \$473; it might even be cheaper now, based on the current price of bitcoin and the difficulty rating—I believe you might get \$11 of cash a month. This is my calculation, and some people might challenge it, but that's my working figure, in which case an \$11 monthly return times 12 is \$132, so your revenue will be \$132, and that's on a \$473 investment. I'm not deducting the hosting costs, but even after deducting the hosting costs, it's a fairly robust return.

What does that mean? That we'll be able to create a vehicle that is able to generate a reasonably robust rate of return, paying a cash dividend that is well in excess of inflation. If we can succeed in locking in our expenses and keeping them very low, ultimately, the difficulty rating will overwhelm the discounts in the price of the equipment and everything else. There's a finite limit to how cheap you can get electric power; it is what it is. At some point, it will go up. If the costs stay low, and the revenue keeps going up, it will be an extraordinarily robust rate of return. That's what we're aiming at.

In the first mining entity, we had ordered about \$360,000 worth of equipment that hadn't been delivered yet, so we swapped it for a hosting credit to the tune of roughly \$360,000. I know someone in the audience will ask why we didn't do that for the second mining entity. The reason is because the second mining entity doesn't technically exist yet. We haven't yet ordered any equipment, so there's no equipment to swap.

There are many things one can do in this area that are within one's control. The important point is that cryptocurrency is within our control. It's not in the control of the Federal Reserve Bank; it's not in the control of government regulation. To the fairly large degree to which we have control, it's investing in our own destiny. That's an experience that investors really haven't had yet. No

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matter how clever an investment manager is, we all have to take market risk, interest rate risk, and volatility risk. People are searching constantly for ways to control all of these exogenous factors.

The real impetus for this cryptocurrency effort is to create investments where the volatility, to the degree volatility occurs, is something that we can control and we can deal with. If you really want a diversified portfolio, you need something that's outside the conventional system of central banking. That's the logic behind our efforts. Hopefully, it ends up being a successful investment. We think it will ultimately be a major asset class, so we're putting a lot of effort into it.

That doesn't mean we're not paying attention to standard investments and standard investment management. On a typical day, you should know, I don't really do anything with regard to cryptocurrency. I just dream these things up and my very able staff works on them on a day-to-day basis. And they give me some very well-put-together reports once a week.

The bulk of my time is spent reading, writing—I spend a lot of time writing—giving some talks such as this one, and looking for other investment opportunities. There are some out there; it's just that the opportunity set is shrinking, as it should shrink. If markets are, more or less, at all-time highs, I think it's ridiculous for people to believe that they'll find as many investment opportunities as they would when the market is at a low or someplace in the midpoint. You just have to be mindful that that's the way the world works. And I don't think it's going to work any other way.

As a consequence, if you look at our balance sheet, you will see that we have more cash than any time in the history of the company. It's there for a reason, but not for the 2%-point-something interest that we get. It's there because the good thing—the opportunity—and also the bad thing about investing is that when the opportunities present themselves, it's usually in an environment where people are fearful and very reluctant to invest money. When you want the money, you rarely get it. And when you don't want the money, you have a lot of it. The function of this cash level was to make sure we would have a liquid pool of capital available that we could access whenever we needed to.

Beyond that liquid pool of capital, there's also another, completely different liquid pool of capital in Horizon itself. There are a lot of completely untapped credit lines. Maybe we'll never use them but, altogether, the available liquidity is not a small number. You'll also notice there are various funds that we invest in, and there's a fair amount of liquidity in those funds, too. So, if opportunities present themselves, we can move very quickly. But the opportunity set is very narrow right now, and the opportunities are not presenting themselves.

That doesn't mean we haven't invested, as you can see from our financial statements. We've been putting money into Horizon Kinetics Hard Assets; we've been putting money into the mining operations. Other opportunities will present themselves, even if the market doesn't correct at all. We're ever vigilant, and we believe that we've positioned ourselves for a problem, if a problem should happen. If it doesn't happen, well, we'll just have a lot of cash on the balance sheet.

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So, now you understand our motivation. We're interested in growing the asset management business in a way that's profitable to us and profitable to you. We're not interested in competing for business on a zero-fee basis. That's the message I wanted to leave you with.

Would you like to add anything, Steve?

Steven Bregman – President & Chief Financial Officer

What else can I add? You have big thoughts; I have smaller thoughts. This is just a reaction to your discussion of Amazon and float in indexation. This is a smaller observation than the one you were making. The inside ownership is roughly 17%, and so, by Wall Street definitions, the float is 83%, but then you have all of the index holdings. There's one estimate of what proportion of stocks are held by indexes or index instruments—and the estimates vary widely, above and below this figure. But we chose a paper from an academic journal, and it was pretty comprehensive. And they estimated that about 36% of stocks are held by indexes.

For the indexes, it's more of an either/or binary function, since they can't make Amazon stock available for sale unless they get net outflows. Then, for practical purposes—it's not an official definition, though maybe it should be—the float of Amazon would be 100% of the outstanding shares, minus the inside ownership of 17%, minus the 36% held by indexes—if that's the figure. In which case, practically speaking, the float of Amazon, if you want to go out and buy some, is now less than 50%. So, that's already uncharted territory.

What becomes interesting, to me at least, is that week by week, as indexes own more of the shares, that float is actually decreasing. If you want to see what happens, as a mental experiment, moving forward, if the net amount of assets flowing into indexation continues in the next five years as it has in the prior five, that would be a 20% per year increase in indexed assets. But even if you only use 15% a year, then indexes will own 75% of the Amazon shares five years from now, and the float will be less than 10%.

If you have incoming demand on a smaller and smaller availability of supply, you could get a spectacular result. That could be interesting. But you see, in an individual security sense, which you can apply to a large part of the rest of what the people think of as the market, the S&P 500 kind of stocks, how bizarre it can get before it changes. But people tend to think linearly—I know I certainly do: “What *has* been happening is what *should* happen.” But it just can't continue ad infinitum. And it can't even continue as long as it has for the last five years. I mean, think about it; it's not practical. Something else will change first.

Murray Stahl – Chairman & Chief Executive Officer

The takeaway point is: you have a machine to buy securities, and it will continue to buy securities, irrespective of the price. There's no question about it. I have nothing against Amazon itself, other

than it does have, obviously, a very high valuation. But the machine will buy, irrespective of price. Here's a rhetorical question. I don't know the answer; maybe you do. Are the other investors, the ones who would have to buy the index because the index is growing—are they aware of this phenomenon, that the machine would pay any price? Or are they not?

By the efficient markets criteria, they are aware of it. If they are aware of it—and the academics seem to agree that they are aware of it—why would they not take advantage of it? And, if they're taking advantage of it, then the securities in question are at unsustainably high prices, which is why we're at the highest valuations in history.

What if it doesn't continue? By definition, if we're over 50% indexation ownership of the total available stock of Amazon, then we're at the total of 50% of the stock of most companies. You could then, incrementally, be at 49%, 48%, 47% and so on that's the remaining float. The float is shrinking, and each percentage point of increased index ownership is a greater proportion of the remaining denominator, the float. So, if we were at 70% index ownership of a given stock or even the stock market, and the index wanted to buy another percent, that would be 1% out of the remaining 30%. At some point, the curve becomes a hyperbola. In my opinion, it's extraordinarily dangerous.

People need to be mindful of that. We try to be mindful of that. It might seem like we do bizarre things that are off the beaten track. We do it because we don't want to be there when that party ends. I hope it doesn't end, and I'll frankly also say I hope we're wrong. It would be a lot better for the world if we're wrong. But we might not be. And every day that we think about it, we keep coming to the conclusion that we're actually right.

Anyway, I'll give you an opportunity to ask us some questions, if you like.

Questioner 1

Thank you again, Murray and Steve, for those remarks. My question relates to your comment, Murray, about credit and this bubble, for lack of a better word, that seems to be vulnerable, particularly given the composition of credit and the increasing percentage of that \$71 trillion of debt that is sub-investment grade. The question is: is there a way to benefit—to the extent that that credit deteriorates in price—through any publicly traded debt in its various iterations; perhaps it's a collateralized loan obligation, or it resides on a non-bank intermediary balance sheet. Is there a way to benefit that perhaps FRMO could take advantage of as that credit fundamentally deteriorates in value?

Murray Stahl – Chairman & Chief Executive Officer

If we actually get to a point where bonds trade at significant discounts to par, we could use very small amounts of our capital to lock in lots of cash flow, if it ever gets to that point. It's just

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nowhere near that point right now. Virtually any credit, right now, based on the way it's priced, is considered to be a good credit. And, at least in light of history, that's not true. I might be off a basis point or two, but we live in a world where I believe the 10-year German government bond is yielding 37 basis points—for a 10-year risk.

I wouldn't say that people are irrational; that's why I resist using the word "bubble." They're not irrational. They just want to get a higher return than 37 basis points, so they'll buy something that is not exactly a very robust or exhilarating credit but is one that will yield considerably more than 37 basis points. What's considerably more? 5%. Why, in our reckoning, is 5% inadequate? I'll walk through the math and you can see what the problem is, even from our point of view.

Let's say you bought a portfolio of 100 bonds, and that the average bond yields 5%. So, you're making 5%. Let's assume, which is not true, but just for purposes of this discussion, that Steven and I are the greatest credit analysts in the world. It's not true, but let's just say we were. The question would be: How often are we right, and how much are we wrong? Of these 100 bonds we bought, how many times will we make a mistake? Let's say we're right 80% of the time—which is pretty darn good—and wrong 20% of the time. How much money do we lose when we're wrong? Let's say it's a 20% loss, because bonds don't yield much, they have more downside protection. You lose 20% on 20% of all the investments, each being a 1% position. Well, 20% of 20% is 4%. So, if we buy bonds yielding 5%, even though we might do a great job, we will end up with a 1% return.

But, maybe it's not a 20% error rate; maybe it's lower than that. Even so, you could dramatically improve the error rate in our favor and get a yield of 2%. But that's still inadequate for the risk that you're taking. That's the fundamental problem.

I don't say that people are irrational for taking the risk. It's totally rational, because they want a higher rate of return. But it's not rational, in our opinion, to bet other people's money that we'll be able to do that. I don't think it's rational or even reasonable. So, I hope that answers your question.

Questioner 2

Murray, with respect to indexation, since the index funds have approved China as an appropriate country to be indexed, how will that affect share prices there going forward, in your opinion?

Murray Stahl – Chairman & Chief Executive Officer

We don't really have a lot of money invested in China. One of the reasons is that the government of China has taken a great interest in stock prices, and it takes it upon itself to impede people who are interested in selling stock. The government of China "encourages" (I think you know what "encourages" means) certain entities to buy more stock. I don't live in China, so I don't know exactly what happens if they don't comply, but I don't think it's good. It's not a free market.

What information content is there in Chinese stock prices? None that I can see. If the government is going to engineer what stock prices need to be, that's not a market that I think any investor can reasonably expect to profit from. Ultimately, only so much money will be created and, ultimately, these sorts of policies don't work out.

By the way, the Japanese government is doing the same thing. I don't remember the number—it sounds like an absurd number, though I don't think I'm very far off—I think they own 75% of all the indexed money in Japan. If I'm wrong, it's only because it's a higher number. The Swiss National Bank owns a very large number of stocks all around the world. What business does the Swiss National Bank have buying stocks? I don't know.

These are problems that we have to contend with. Where we see these things, and we can't find a reasonable resolution to them, we just stay away. I think it's the only reasonable thing to do.

Questioner 3

Murray and Steve, on occasion, you like to update us on a couple of your larger positions. Would you care to comment on Texas Pacific Land Trust and Civeo?

Murray Stahl – Chairman & Chief Executive Officer

Texas Pacific Land Trust (TPL) is very easy. For those who don't know what it is, it's just a trust. It's been around since 1888. It was a result of the bankruptcy of the Texas and Pacific Railroad. Basically, over more than a century, they've taken their cash flow and used it to buy back stock. Since that time, they've bought back about 97% of all the original shares outstanding. If you like calculus, this is a stock for you because every time they buy back a share, the next share they buy back is a greater proportion of the remaining shares, which is the denominator in the float calculation.

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In theory, the per-share net asset value, assuming it were a constant, should increase at an accelerating rate. But, fortunately, there are many other interesting developments in the area in which they operate, which is West Texas. It's called the Delaware Basin. It's an area where everyone knew hydrocarbons existed, but no one believed they were extractable. The hydro-fracking revolution made these deposits extractable, and it's only just starting.

If you use Google Earth to look at a map of the applicable counties, including Loving County, Culberson County, and Reeves County, and compare the amount of infrastructure, such as roads, pipelines, gas-gathering systems, and electric cable, among other necessities, to what's in Midland County, which is in the center of Texas and has been producing oil for a long time, you'll see that the TPL counties look empty compared with Midland County. And I would argue that the TPL land is better and that the hydrocarbon reserves there are more prolific.

To extract the hydrocarbons, the exploration and production companies need water, and TPL has water. They'll need a gas-gathering system; they'll need pipelines. All this activity is just starting. Eventually, as in Midland, some people will choose to make that area their home, and they will be developing those areas for probably the next 60 years.

In my opinion—and it's just an opinion; I could be wrong—I believe the revenue is likely to go up and go up a lot. But, unlike your typical company involved in hydrocarbon extraction, TPL doesn't really have a lot of costs. It has a small staff so, when revenue goes up, the costs don't rise proportionately as in a normal corporation. That's what makes it such an interesting investment.

By the way, it's also not included in any index, and they keep buying back their stock, so there aren't that many owners. That's kind of the way we like it. And I expect TPL will continue to do very wonderful things.

Steven Bregman – President & Chief Financial Officer

As Murray suggested, look at Google Earth, and start way high up. Zoom in slowly over Midland County in Texas, where the older oil fields are. If you go slowly enough, at a certain point you'll see what looks like some interesting looking dots in a grid pattern. It looks like someone took pins and stuck them on the surface. At first, you can't tell what they are. But, as you zoom in closer, you'll see that they're little squares. If you get closer, you'll realize that each of those squares are concrete drilling pads. And you'll see how dense that pincushion is when you get down there.

Then, if you pan back out and move westward over to the Texas Pacific Land Trust acreage, you'll see that there's hardly anything there. That's a really high-impact visual representation of the difference in the intensity of the land usage.

Murray Stahl – Chairman & Chief Executive Officer

Two more points: first, if you happen to fly over that area at night on your way from the West Coast to the East Coast, or vice-versa, you'll observe that there are fires burning. You can see them flaring off the gas. They're flaring off the gas because there's no gas-gathering system—I mean there is some system there, but it's not extensive.

In about in nine months, there will be the first significant gas-gathering system. They will no longer be flaring off the gas; they'll be selling it. Same expenses, more revenue: a really great situation to be in, which is why we have money invested in that security.

The second point is that as the opportunity set constrains—and indexation is not going away; it just has its obvious problems—what will happen in the future is that investors will achieve diversification by finding those managers that have a small but good opportunity set to work with. A given investor might want to be more diversified than any one of those managers can provide, so they'll just have to hire five managers. It will be a different way of achieving diversification, rather than forcing managers to create some false diversification by buying some lesser entities that are just lesser opportunities. I think it has major implications for the whole way assets are managed.

Steven Bregman – President & Chief Financial Officer

Civeo Corp. Are many of you familiar with that name? I'm not sure Civeo Corp is a very significant investment holding on FRMO Corp's balance sheet, but it is a large holding in a number of equity portfolios at Horizon Kinetics.

This company provides temporary housing which, in this instance, is modular housing units for remote locations, such as in the parts of Western Australia that look like Mars, where there is mining, or in Canada, in the Canadian Oil Sands regions. It's basically trailer housing except that in its current incarnation, it can look like villages and apartments. Workers have locker rooms, bar/restaurants, game rooms, and all sorts of amenities.

Look at the stock price and the revenues and earnings from several years ago, when you had both China's demand for iron ore and related commodities and compare it with when oil prices were coming down resulting in a decline in drilling activity, and oil company activity. Civeo is a relatively modest-sized company that gets its demand from those mining and oil companies. So, the impact on Civeo, like second-derivative impact, was far worse. And the stock's price had fallen an awful lot. It's come back up quite a bit, too.

Ordinarily, we don't favor companies that have a fair amount of debt. But, after losing the major part of its revenues, this company is still profitable. It's cash flow positive. It has negative stated earnings, which may be one reason why it's not popular. But that's because Civeo has a lot of non-cash amortization charges. Considering their actual cash flow, net of their capital expenditures, the

shares actually trade at something near a single-digit multiple of free cash flow, which means the company is not existentially challenged from that perspective. Part of the company's strategic approach is to pay down debt with free cash flow over time. Because they have the facility to do that; even if their operations don't improve beyond where they are now, it means that a certain proportion of their debt is paid down each year, which means the equity value will be higher each year by the amount that they pay down debt, and you could earn a very nice return just on that.

At some point, demand and supply will come back into balance, and Civeo could do better still. We think that we've got a lot of interesting optionality in these shares without all that much risk. If it does well, it can really do well in terms of multiples of its current stock price. So, it's just a matter of waiting.

Questioner 4

Just as a quick follow-up on those comments: If it's a compelling opportunity for Horizon Kinetics, and you have cash in FRMO, why wouldn't you have a little more exposure to it in FRMO?

Murray Stahl – Chairman & Chief Executive Officer

We created something called Horizon Kinetics Hard Assets. We didn't want to have very many investments in it, for reasons I alluded to before because, ultimately, it's building a record based on a handful of investments. We had to pick between a small number, and you can probably guess which one we picked. We don't have the requirement within FRMO to be as diversified as we would need to be in a client portfolio. And we also have the flexibility of having a lot of cash.

We don't subscribe to the idea of saying: "Well, as long as there's money to be made, we really should make it and not leave cash on the balance sheet." In a corporation, you can do that sort of thing, because cash is a strategic asset. But we're waiting for a much larger opportunity. We want to have liquidity available when we need it. That's another reason for being more selective. We wanted to have a big balance sheet. We wanted to have a lot of cash, rather than try to maximize results in the short term.

If an opportunity arises, we don't want to have to sell something to buy something. We have what we like, and we expect to keep it that way for a very long period of time.

By the way, a modality for Civeo is that the costs are stable, because it's a fixed-cost business. Either the business is getting better or it's not getting better. If it gets better, it'll have more revenue, but it'll have the same costs. With more revenue, earnings will materialize, meaning the marginal revenue will go more or less to the bottom line. If the business doesn't get materially better, they still have cash flow. They'll eventually pay down their debt, and it will become a better stock.

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The idea is not to use up every morsel of cash because there is an opportunity to make money. The idea is to build a corporation that will be able to take advantage of a major opportunity to reorient itself, if it comes, which it might not.

Steven Bregman – President & Chief Financial Officer

I'd like to add another remark about cash. It's just a different way of saying the same thing. But it appeals to me in a way. Many people think of cash as a wasting asset that we are not using to good advantage. Other people just think it means you don't have a good idea. And I imagine most people here might be in one or both of those two camps, but they understand that cash can be used for future opportunities.

But there's another interesting way of thinking about it, which is that cash is a unique asset. Think of it as a strategic asset class. And I frame it this way: in terms of definition, it has a property almost no other security has, which is that it has enormous elasticity of purchasing power. Other asset classes or securities or properties go down in price, and suddenly your cash is worth that much more, because you can buy more with the same amount.

Murray Stahl – Chairman & Chief Executive Officer

Roger Babson is one of the people who became famous for calling the crash in the 1920s. He wrote an autobiography, and in it he relates that at the start of his career—this would be about the turn of the 19th century into the 20th century—he went to Great Britain and met some famous investors. When he walked into their office, they didn't seem to be doing anything. They had a considerable sum of money at their disposal, so he asked: “Well, how can you be investing money if you don't do anything?”

They said: “Because there's really nothing to be done. We only get busy once every four years. We wait for a crisis and then we buy very heavily. Then, as the market recovers, we gradually sell. At the end of four years, we end up with a very liquid portfolio. Then another crisis or something similar happens and we get busy. We're only busy once every four years.”

After the stock market crash of 1929, there was also a virtually simultaneous real estate crisis. And Roger Babson is famous for buying a lot of choice land in Florida in the early 1930s. He made a lot of money that way. There are many ways to get to the same point in investing.

Questioner 5

I had a quick question about Winland. You've changed the name from Winland Electronics to Winland Holdings and made it a whole new company. But, outside of that structural change, not much seems to be going on. You have two young managers, Matt Houk and Tom Braziel. I've met

Tom a few times, and I think he's a genius—a terrific investor. To keep this short, when are you going to release the hounds and kind of let them do their thing?

Murray Stahl – Chairman & Chief Executive Officer

All right, so the question is: when am I going to release the hounds? I wouldn't call them hounds.

Questioner 5 (cont.)

Call them thoroughbreds.

Murray Stahl – Chairman & Chief Executive Officer

Okay, thoroughbreds. Actually, they are released; I don't prevent them from doing anything. They're doing two things, basically, if I can talk in generalities, because they probably wouldn't appreciate it if we revealed their plans. On the capital side, one reason they became a holding company is because Winland, in its capital incarnation, had excess cash on the balance sheet. They had the idea of investing in trade claims, which are basically credit liens. These credit liens are too small to interest a bankruptcy workout investor, but they're not too small for Winland.

On the monitoring instrumentation side of the business, the challenge is: you can only grow that kind of business so much without taking in partners. In the world of monitoring, it's important to collaborate with other companies. Monitoring is a very specialized function. Even if you have the right product, you need to invest a certain amount of money in marketing which, frankly, I don't think Winland has. So, if it were possible, it might be good to team up with some other corporation.

Basically, those two fronts are why Winland became a holding company. There's a capital side of it to invest the excess funds, and there's an instrumentation side of it. Hopefully, we can grow the instrumentation side of it, although we're obviously competing with very large companies.

Questioner 6

I have two questions. One is related to FRMO and one is related to crypto mining. I'll start with the crypto mining question. I did some mining, but on a very small scale, so I didn't have the economies of scale that I presume you have. The difficulty rate rose so rapidly, and the cycles of the new mining equipment coming out, with the specialized ASICs chips, was so rapid that even though the return could be in the 30% or 40% range for the mined currency, the equipment quickly became relatively worthless. The difficulty rose so rapidly that the productivity of a particular generation of equipment declined much more rapidly than predicted. I wanted to get your thoughts on whether you were seeing the same things that I saw. At some point, I decided that it's just better to buy the cryptocurrency directly than to mine it.

Murray Stahl – Chairman & Chief Executive Officer

Before we created a cryptocurrency mining fund, Horizon Kinetics bought some servers. At the time, we could only base our assumptions about how long the machines would be relevant on what had happened in the past. We had to presume that in not very many months—we didn't know how many months, of course—the servers wouldn't be worth very much. But we're still mining cryptocurrency with them today. So, they have lasted a year and a half.

The first phenomenon is that we arrived at the point where it became very difficult to increase the efficiency of that ASIC (application-specific integrated circuit) chip used to solve the elliptical functions required to mine bitcoin. You might be able to improve it marginally, but a lot of people have tried and, so far, they can't make it a lot better. What might happen is that the equipment could last a lot longer than anybody thought. That's what first attracted us to it.

The second observation that attracted us to mining is that even without the improvements in technology, which are marginal right now, the price of equipment is falling. What does it mean if the equipment price goes down by 90%? It means that for each server you could have bought less than a year ago, you can now buy nine. If you're able to hold some of your cash flow in the entity and not pay it all out, what does it matter if they have cheaper servers available? It means you can buy more servers than you had before, and you can actually have a very robust business.

We observed that a problem in crypto mining entities was as follows. Let's say someone raised X dollars and they took all that money and bought whatever servers were out there at the time. We thought that was a mistake mathematically. What they really should do is to buy a small number of servers, then wait a few weeks or a month, and see what's happening. Then maybe buy a few more and buy a few more. When we started, we assumed that the servers would be physically worn out at the end of 36 months. But I'm not sure that's a good assumption anymore; they might last longer. Our experience suggests that they will last longer.

Buying the machines incrementally instead of all at once means that you're always replacing a little bit of your equipment at lower prices. It's not that they're more productive; it's just that your dollars are more productive in terms of what they could buy before. You can have a fairly robust rate of return, but you have to be willing not to try to maximize your return upfront. That's how we handle it, and I would say it seems to be working pretty well.

Questioner 6 (cont.)

My second question on FRMO is that I always found the filings to be somewhat inscrutable, or difficult to figure out. I assume it's somewhat buy design. If, let's say, it's trading 2-point-something times book value and, assuming it's a sort of holding company—a Berkshire Hathaway type—and in the case of Berkshire, they give us the information to figure out what the intrinsic

value is. They even put in a policy saying that if the price falls below X multiple of book, they'll buy it back. As a shareholder, or a prospective shareholder, could you help us understand how to value FRMO?

Murray Stahl – Chairman & Chief Executive Officer

Well, a couple points on that. The first is that even with the generally accepted accounting principles, when you see a certain amount of FRMO shareholders' equity which, of course, is the book value, you're not really looking at the book value. The reason is that we have investments in certain funds, and they report with a lag. When you read the balance sheet for May 31, 2018 (FRMO's fiscal year end), many of the investments are priced as of March 31, 2018. But right now, we are in September of 2018. I could presume, to the degree they are able to do so, that observers make certain adjustments, at least mentally, as to what our actual book value is, taking into account the reporting lag of some of our investments. So, you have to do that also.

The second point has to do with FRMO's challenge to build a revenue stream that is incremental or additional to the asset management business. Why is that so important? Because, as much as we're not going anywhere, we're not retiring, we're not quitting, we're going to keep doing this—but nothing is forever. If you want us to provide an intrinsic value in the Berkshire Hathaway sense, there have to be businesses below it that can operate without us. To a small extent, you could say Winland is like that, but it's only a very small extent. You can maybe say the asset management business is like that to some degree, though to what degree is a matter of judgment.

I can only presume that the market is making a judgment on our ability to generate independent revenue streams. To a very small degree, we did it with cryptocurrency, because we actually mine cryptocurrency. We mine cryptocurrency not merely in FRMO; we also mine cryptocurrency in Horizon Kinetics because, before we created the cryptocurrency mining entities, we wanted to try it ourselves.

We calculated that, if the business works the way we think it does, at some point, the price of the mining equipment will shrink to a level below which it can't go. At that point, we should be able to deploy significant amounts of capital and turn that cash into an operating business. Then the market—I can only presume; I do not know—the market is making a judgment on our ability, rightly or wrongly, to be able to do that. Hopefully, we'll have the wisdom to do it well. That's the direction in which we're currently proceeding. Maybe you want to comment?

Steven Bregman – President & Chief Financial Officer

It's a commonality that anybody here, I think, has some analytical frame of mind and is interested in small, undervalued companies. So, you've been through this exercise. Cash on the balance sheet is valued on a one-for-one basis, or less than a one-for-one basis, typically. Sometimes, depending on the business model and who the management is and what the plans might be, there are some

people who might ascribe some value to what that prospective result would be—I'm just simply restating in a different way what Murray was saying.

If that cash were deployed productively, say by buying an existing business with a certain revenue stream, then suddenly the market will apply some multiple to the earnings. Suddenly, that \$1 of cash is valued at some multiples of what it was. In a sense, it could happen with the flick of a switch. It's just the way it works. So, part of the answer is: how do you look at that cash, which is quite significant?

Murray Stahl – Chairman & Chief Executive Officer

If I may, I'll add to that, in deference to your original question, we obviously compete with other cryptocurrency mining companies. There are a number of them that you can look at, and they all have the same balance sheet. They have minimal amounts of cash and lots of servers. In contrast, we have some servers, but not very many, and a lot of cash. Some of the other mining companies are publicly traded, and they're valued at X.

Let's say we were all in a room, and we were discussing the business with them, and we posed the following question to them: would you rather have our balance sheet, a small number of servers, and a lot of cash, or would you rather have your balance sheet, a small amount of cash, and a lot of servers? I think they would pick ours, but we wouldn't swap with them. So, that's my view of the situation right now.

Questioner 7

I'd like to take the liberty to respond to that question, at the risk of embarrassing these two fellows. I've been an analyst for a number of years, and I've created a valuation ratio that doesn't generally exist. I used to be an analyst at a brokerage firm for 23 years, and after that, I was an analyst at my own little fund management firm. At the brokerage firm, we always had to put a section in the report captioned "Management." And you had to say something about the management of the company that you were writing about. When I think back about that section, it was sort of a bio about the people, and we used to say that we had a lot of confidence in the management. If we didn't have confidence, we probably wouldn't be writing a report about the revenue growth, earnings growth, cash flow growth, and so forth, and the valuation multiples.

The ratio I devised when I decided to invest in this company, FRMO Corp., over the years was price-to-gray matter. I calculated that I have a very low price-to-gray matter ratio in this company because, when I met these two fellows, I thought the gray matter was extraordinary. Frankly, I don't know of another company in my portfolio of investments, nor have I ever come across a company, that had two fellows like these who work for nothing, in FRMO at least. Although, I can't really say exactly nothing, because they're the two largest shareholders in the company, so they're working for their investment. But they're not working for their current compensation. And

I think the price-to-gray matter ratio is very low. So, I'm just mentioning that as something you might consider. I can't think of another company to which I would apply a price-to-gray matter ratio into the calculation of what it's worth.

Steven Bregman – President & Chief Financial Officer

I'll just say that this gentleman is Larry Goldstein, one of our directors. And, in terms of investment, he was the first outside investor to buy us lunch. Being a value investor and analyst, it was just sandwiches that he brought into the office.

Murray Stahl – Chairman & Chief Executive Officer

But we did eat them.

Questioner 8

You often quote the percent that you have in bitcoin, relative to the balance sheet. But then you talk about the exchange investments and the strategic assets. And I noticed on the last Overstock call that tZERO was having a hard time with the exchange. If I understood it right, they had to partner with some other exchange, because it took so long to get the approvals. If your thoughts on crypto are correct, is that just another vector? Could these exchanges have extremely large opportunities with crypto?

Murray Stahl – Chairman & Chief Executive Officer

It's very possible. And, to go a step further, there are some people who believe that within 10 years, crypto will be the way every single company will come public. This idea is really inherited from the 19th century, when the concept of a joint stock corporation was created. The way a company raises capital is by creating a joint stock corporation and selling some portion—10%, 20%, 30%—to the public. And that's how you aggregate a large quantity of capital.

The trouble is that you're always selling it at a premium to book value. There's a natural conflict, in the sense that the owners of the corporation, or the previous owners, or the management, are trying to raise that money at the lowest cost-of-capital, which means the highest valuation multiple, while the investors are trying to buy it at the lowest possible price; and they never seem to hit the proper mean. The shares of most initial public offerings (IPOs) usually go, eventually, below the IPO price, and it's a very unsatisfactory way of investing, to the degree that, today, we don't even invest in many IPOs.

In the future, what we believe will happen is that a company will come public not by selling its shareholders' equity, but by selling its product. For example, if Apple were coming public today, perhaps it would sell a crypto coin that would entitle you, as a holder, not only to own a piece of Apple, but also, let's say, entitle you to a free iPhone once a year, or a free iPhone twice a year, or a certain amount of merchandise, in perpetuity. You would have a perpetuity that is paid for in revenue. For a food company, you would be entitled to food. For an oil company, you would be entitled to oil, and so on.

Let's say there were such an IPO for an oil company. For instrumentality of the company's crypto coin, you would be entitled to so many barrels of oil per coin. It would be like a perpetual oil future or a British console—a perpetuity bond or a future that never matures. That might happen.

In Canada, some gold companies are exploring just that. In their case, it's a royalty interest, but what you're really buying is a coin that entitles you to a certain amount of gold production over the company's life, and its life might be infinite. We don't know yet, but I believe this capital raising method will be big.

If you think that way, imagine how many different coins a given corporation could create. If a corporation produces 10 products, they could have 10 coins, not one stock. In the world of bonds, think about this approach in the following way: how many companies have one stock, yet they have 100-200 different issues of bonds? Well, why not have a diversified company that might have hundreds of products that give rise to hundreds of coins that entitle you to specific items? Think about what opportunities might exist for exchanges in that kind of world. It begins to get very heady and mind-boggling, if you begin to think about it. But those are the possibilities.

You have two choices in exchanges. There are the ones that are at the leading edge in technology, and there are the ones that are not, yet they have a license or licenses. We invest in both, but mainly we invest in the ones that have licenses, but are not necessarily technologically developed.

The Miami Options Exchange (MIAX) is at the leading edge of technology. Who knows where they could take that technology? It's a totally fascinating subject. In my opinion, this area is going to move very, very rapidly in the next couple of years, which is why the CME, the CBOE and the Intercontinental Exchange are engaged in bitcoin futures. The CBOE, for example, is not involved in bitcoin merely for the privilege of trading 5,000 contracts a day, which is irrelevant in relation to the scale of their business. But they see the possibilities and recognize that they need expertise in cryptocurrency, just as we see that we must have expertise in cryptocurrency. It's hard to overstate the importance of this as a strategic initiative.

Questioner 9

What are your views on bitcoin in relation to the other cryptocurrencies, like Ether and Litecoin?

Murray Stahl – Chairman & Chief Executive Officer

I think there are 1,938 different coins. I may be off by one or two, not that it matters, because most of them will fail. When I say “most,” I mean well in excess of 90% will fail. Why do I say that? Because the first way to be successful is to give people an incentive to operate the system. The coin is not merely a security. The SEC may say it’s a security—and from a regulatory view it might be—but it is also a system that needs validation. Someone has to monitor and process the transactions, and they have to be compensated for that work.

Most of the coins have white papers and, if you read even a sampling of them, they’re conceptually brilliant, except that the creators have treated them like IPOs, meaning that the bulk of the coins belong to the people who wrote the paper, thereby leaving no coins for anybody else. So, yes, as miners we could operate one or another of the systems, but we wouldn’t get paid for it, so why should we do it? Why should anyone else? The creators of the coins didn’t provide incentives to support the system, and that is one of the reasons I believe most of them will fail.

Bitcoin works in a different way. The bulk of the coins were available for compensating the people who process the system. That’s why it became the biggest coin. That’s what all these brilliant conceptions, some of them much more brilliant than bitcoin, failed to do. They thought in terms of technology: one coin is faster; another coin facilitates smart contracts. Bitcoin doesn’t do that. The other coins are more scalable, but their structure doesn’t provide for sufficient compensation for anybody to operate the system. Even with all that technology, why should anyone validate the transactions if they’re not being paid? That’s basically the challenge, and that is why bitcoin gains dominance over every other coin, basically every day.

Questioner 9 (cont.)

What about the bitcoin forks?

Murray Stahl – Chairman & Chief Executive Officer

Let me review a bit. A bitcoin fork is basically a variation on the bitcoin system. Anyone can create a cryptocurrency. If you want to create a bitcoin fork, you can, and it doesn’t take a lot of effort. As a matter of fact, there is a free program called ForkGen that allows you to change one or more properties of bitcoin. If you want to make a faster bitcoin or make one that is more transparent or less transparent, or you want more security—whatever it is you want to do, you can use ForkGen to add those features and create another coin, if you are so minded.

There have already been a number of bitcoin forks. There’s Bitcoin Cash, Bitcoin Gold, Bitcoin Diamond, and Bitcoin Private, to name a few. They don’t have a lot of value, for a couple of reasons. First, people don’t know what they do. Then, there’s not much mining processing power behind them, meaning people validating the transactions. Then there are some people who were

entitled to the new coins, but never collected them when they were forked from bitcoin. Some people collected them when they forked, and they sold them. I think that was a terrible mistake.

If you're going to hold bitcoin, you should hold the forks. If you want to buy bitcoin after it has forked, you should buy all the forks, too. The reason is because all of the bitcoin forks have the same technology and the same or a similar monetary policy. If they find proper applications for bitcoin, the world will likely find proper applications for the forks as well. I think it's foolhardy for people to ignore the forks.

If you were buying one bitcoin, even though the price of Bitcoin Gold is something close to \$2, if you buy one bitcoin, you should also buy a Bitcoin Gold, a Bitcoin Cash, a Bitcoin Diamond, and so on. You should buy them all.

The only other coin to which I would give honorable mention is Ripple or XRP. I don't know if it will be successful, but it has an interesting property. It has the feature, unique among cryptocurrencies, that its total number of coins is constantly shrinking. When you buy a stock, you pay a certain commission. When you buy or sell Ripple, you pay a commission, but the difference is that the commission doesn't go to a broker. Instead, the commission is what's called in the technology "burned," meaning it ceases to exist. The commission might be a couple of pennies worth of Ripple for buying a certain amount of the currency. Those couple of pennies worth in commission are destroyed, so the total amount of Ripple outstanding shrinks.

The number of Ripple outstanding started with 100 billion. Today it's about 99.9 billion. It hasn't shrunk a lot, because the velocity, the trading volume of Ripple is not significant. But what if the velocity changed for whatever reason? What if it went up a lot? It's theoretically possible that it might become valuable.

There are a lot of reasons why Ripple might fail, and I'll go into them if you'd like. For the moment, just talking about coins, if you're going to be in cryptocurrency, in my opinion, it's worth throwing a couple of pennies into XRP, although we're a very long way from getting the velocity needed to shrink the total outstanding. But it might happen.

Questioner 9 (cont.)

Is it your opinion that the other popular coins like Ether and Litecoin are not so interesting?

Murray Stahl – Chairman & Chief Executive Officer

I'm not crazy about Ether, which is known as Ethereum. We've mined it, but we sell it once we receive it. Ethereum has many characteristics that we aren't crazy about it. First is the monetary policy, which they're actually changing. The original monetary policy was to keep issuing coins forever, so there was no fixed issuance. Ultimately, the percentage of issuance does decline

because, as the denominator—that’s the number of coins—increases, they continue to issue a constant amount every year. As a percent of the denominator, the annual issuance will fall if you add enough years and, right now, cognizant as they are of the monetary policy, they are talking about or planning to reduce the volume of issuance.

The reason that Ethereum has a higher inflation rate than bitcoin, is that they needed to issue more as a way of compensating the miners. They started out at a lower valuation, which is to say total market value, than bitcoin. Everybody starts out at a lower valuation than bitcoin has. Therefore, if a currency has the same monetary policy as bitcoin, the miners of that currency will be compensated less. That’s a big problem.

When they say: “We understand; we should have had a more restrictive monetary policy,” that might be right, theoretically. But then they say: “We want a more restrictive monetary policy,” meaning issuing fewer coins; yet, that would be reducing compensation to the miners, giving them less incentive to work with you. If I were the decision-maker, I would’ve left well enough alone. In my personal opinion, I think they made it worse, I’m not crazy about Ethereum.

Litecoin is basically like bitcoin, with a fixed ultimate issuance policy, except that it was created earlier in bitcoin’s cycle, meaning the interim inflation rate is much higher. I think the total issuance is 4x that of bitcoin. Bitcoin’s total issuance will be 21 million. I think Litecoin will be 4x that. It has a much higher inflation rate right now, but eventually the two inflation rates will converge, because they have very similar technologies. It may well be that people find a use for Litecoin. It might not even be a bad idea to buy a few Litecoins. But where we own cryptocurrencies, we own bitcoin.

Questioner 10

Would you could comment on the RENN Fund, and what your plans are for it?

Murray Stahl – Chairman & Chief Executive Officer

As many of you know, we became the investment manager of the RENN Fund in July of 2017. At that time, it didn’t have a lot of assets under management. Strategically, the RENN Fund is important to us because we believe, ultimately, a better way of creating a mutual fund is through a closed-end, not an open-end, structure.

Generally, in an open-end fund, you’d like to be able to get the expenses down so you can compete with the ETFs. Of course, when you’re down to zero fees, it’s kind of hard to get the expenses down to zero. But, assuming you could, here’s the problem: Every mutual fund is on a platform, which is their mode of distribution. If somebody wakes up one morning and says: “Oh, I like your mutual fund; I would like to put money into it,” and you charge a fee, some of that fee will go to the platform where the money came from. There’s not a lot of cost for that platform, but for the

fund operator, that expense comes off the top line. From our point of view, it would be a lot better to have closed-end funds where we don't have a platform.

The conventional way of funding a closed-end fund is to use an investment banker. That brings us to the second problem. The investment banker will charge the manager a certain amount to raise the money. Okay, we could theoretically pay it. But the investment banker also charges the fund itself roughly 5%, or maybe even 5.5%, of assets under management. Let's say, for the sake of argument, that we raised \$10 a share, to pick an arbitrary number, in the RENN Fund. The investment banker would get 5.5% of that. So, after we raised the money, the client base would have \$9.45 per share invested in the fund, not \$10. That's the standard way of raising money in closed-end funds. We won't do it.

What are the options? They are several-fold. A rights offering is one option. A second is to merge it into another fund or entity that's willing to become a fund and thereby create greater scale. And third is that we could create another closed-end fund, now that we believe we understand the legalities around closed-end funds, because we're in that business.

For instance, I'm sure you can see why cryptocurrency would be much better in a closed-end fund than in an open-end fund, because you wouldn't have the operational expenses of an open-end fund. We might be able to create a very inexpensive fund. So, rather than take the operational risk and pay the insurance for people getting in and out every day, like an ETF, it may well be that, unlike with conventional securities, the closed-end fund dominates in cryptocurrency.

Questioner 10

Would you comment on the future of the so-called premium of the Grayscale Bitcoin Investment Trust (GBTC)?

Murray Stahl – Chairman & Chief Executive Officer

GBTC trades at a premium to net asset value that is, as near as I can calculate it, about 27%, give or take a percent. At one point, it was 100%. Why does it trade at a premium? It trades at a premium because, say what you will about GBTC, at least they worked out the custody problem. Instead of buying bitcoin on your own, investment in this entity means that you don't have to deal with the private keys. The private keys in bitcoin are like bearer bonds; if you don't know what you're doing, someone could take your bitcoin, and there's nothing that anybody could do about it. So, you can see why some people wanted to have the Trust.

Eventually, there will be some type of bitcoin fund. As mentioned previously, there's already one in Canada. It's just a matter of time until there's one in America. Will it be a closed-end fund? Will it be a mutual fund? Will it be an ETF? I don't really know. But it will be something, and there will probably be a number of alternative vehicles.

When that happens, it's reasonable to conclude that the premium in GBTC will dissipate. On the other hand, there could be a countervailing factor, because once cryptocurrency, particularly bitcoin, becomes a bona fide institutional asset, the supply/demand imbalance could drive the price up a lot. Remember, there are only ever going to be 21 million bitcoins, and we already have 17.3-some-odd million issued, and it will take until the year 2140 to issue the rest.

If bitcoin were to become a bona fide asset, here's what would happen. I believe there are something like 70,000 addresses that own 96% of the bitcoin. Now, 70,000 addresses do not necessarily correspond to 70,000 people. We ourselves have many different addresses. So, I don't know if that's 10,000 people, or even as few as 5,000 people. If bitcoin becomes a bona fide asset class that many people want to buy, I don't believe that among the large holders of bitcoin there will be very many sellers. You can imagine what could happen in a very short period of time, given both a very limited number of coins and a very limited float, and we might actually be on the cusp of that. It could be very interesting. So, you could make a lot of money in GBTC, even if the premium dissipates to nothingness.

Well, it turns out that somebody emailed me a question. Not that I have email, but it was handed to me. So, I'll take this question, because I thought it was a pretty good one.

Questioner 11

Relying on your crypto expertise, what happens to the mining operation when all 21 million bitcoin are mined?

Murray Stahl – Chairman & Chief Executive Officer

As I said previously, the last bitcoin will be mined in the year 2140. Well, I can't resist giving a flippant answer, but then I'll give a serious answer. The flippant answer is that I may be remiss, but I haven't been making plans for the year 2140 quite yet. It might be a little premature for that.

Now for a more serious answer: Let's say that we are in the year 2140 right now. What will happen, ultimately, to bitcoin? I believe that people will want all kinds of validation services. There's already a technology called bitcoin lightning, which is a system for transferring coins off the blockchain. There will be fees associated with that service. There are already lightning network nodes that are operating. There will be opportunities to *be* nodes that broadcast to the blockchain. There will be opportunities to charge fees.

The bottom line is that the way the system was envisaged to evolve is for there to be transaction fees that continue to make transaction validation—also known as mining—a worthwhile endeavor. There already are transaction fees. We already earn certain transaction fees for our mining operations. It's just that, unlike the Visa system, where Visa tells you what the fees are going to

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be, this is a distributed ledger. Anybody and everybody can be part of the distributed ledger, so the clientele decides how much they would like to pay for a given service.

Paying the fee just gets you priority. If, for whatever reason, you want your transaction to be processed first, just pay more than the others, and the miners will prioritize your transaction. If you don't mind receiving confirmation six hours or eight hours later, well, then your fee will be lower. It was always envisaged for that to happen, and I believe that is the way it will evolve.

There are so many different uses for crypto. It's not just in quasi-securities, like companies using it to raise capital. Every piece of real estate could be uniquely identified with cryptocurrency. Inventory in warehouses, factories, and stores could all be identified with cryptocurrency—software, books, poetry, songs.

As a matter of fact, in the world of the future, data associated with you will be on the blockchain, and it will be unhackable. Whatever data you would like people to see will be available to them; they just won't know it's you. If they want to market to you, they will need to contact your public key and ask if they can send an ad to you, but they won't know who you are. You'll be able to say: "I'm willing to see a pop-up ad, if you pay me a penny per pop-up ad." Some people might want to do that. That's all going to be processed via the blockchain.

The shift in power will go from the large enterprise to the individual consumer, from a hierarchy to a much flatter structure. Information is power, and it is the key to everything. A corporation is not a pile of assets. A corporation is the information that the people who run it have about how to run it. If I took over a drug company, for example, and all those assets became mine, I couldn't do very much with it. I'd have to hire people, because I don't know how to make new drugs. I don't know how to manufacture existing drugs. I don't know a lot about that business.

Ultimately, information is the key, and that information won't reside in the cloud, in the big database that the large enterprises can have access to, and with which they can basically do what they want. The information will be in the hands of the individual, and the individual will regain the power. In my opinion, crypto will make that possible.

I could go on and on waxing lyrical, but I won't because you'll think I'm becoming enamored of bitcoin, which I'm not. It's just that it is as important, or even more important, than the internet was in the way it changed civilization. Cryptocurrency and blockchain technology will probably change society even more than the internet did. There are no guarantees, but my belief is that it will happen.

I'll conclude with this, and thank you very much for attending and for your support. We're very grateful for it. We'll be around if you have anything else to chat about. Thank you very much.

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