NEW YORK CITY TEACHERS' RETIREMENT SYSTEM

INVESTMENT MEETING

Held on Thursday, March 30, 2023
Via Videoconference
10:11 a.m.

ATTENDEES:

THOMAS BROWN, Chairman, Trustee

DAVID KAZANSKY, Trustee

VICTORIA LEE, Trustee

BRYAN BERGE, Trustee, Mayor's Office

ALISON HIRSH, Trustee, Comptroller's Office

ANTHONY GIORDANO, Trustee

DEVON ALEXANDER, Rocaton

ROBIN PELLISH, Rocaton

AMANDA JANUSZ, Rocaton

RENEE PEARCE, Teachers' Retirement System

REPORTED BY:
YAFFA KAPLAN
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ATTENDEES (Continued):

LIZ SANCHEZ, Teachers' Retirement System

THAD McTIGUE, Teachers' Retirement System

JOHN DORSA, Comptroller's Office

KOMIL ATAEV, Teachers' Retirement System

RON SWINGLE, Teachers' Retirement System

STEVEN MEIER, CIO, Bureau of Asset Management

DAN HAAS, Bureau of Asset Management

ED BERMAN, Bureau of Asset Management

PETYA NIKOLOVA, Bureau of Asset Management

JANET LONDONO-VALLE, Bureau of Asset Management

TOM CARROLL, Bureau of Asset Management

ENEASZ KADZIELA, Bureau of Asset Management

JONATHAN LESSER, Bureau of Asset Management

ALLAN MACDONNELL, Bureau of Asset Management

JOHN ADLER, Mayor's Office

JIMMY YAN, Comptroller's Office

SUMAN RAY, Mayor's Office

KEVIN LIU, Mayor's Office

ATTENDEES:

MARC RIVITZ, StepStone
DEV SUBHASH, StepStone
YING LIN, StepStone
JUSTIN THIBAULT, StepStone
ARISTA AFTOOMIS, Teachers' Retirement System
ISAAC GLOVINSKY, Teachers' Retirement System
MAREK TYSZKIEWICZ, Office of the Actuary
PAUL YETT, Hamilton Lane
SEAN BARBER, Hamilton Lane

Proceedings

MR. McTIGUE: Welcome to the Investment Meeting for the Teachers' Retirement Board for March 30, 2023. I am going to call the roll.

Bryan Berge?

MR. BERGE: Bryan Berge representing Meier Adams, present.

MR. McTIGUE: Thomas Brown?

MR. BROWN: Good morning. Present.

MR. McTIGUE: Anthony Giordano?

MR. GIORDANO: Present, representing PEP Chair Angela Green. Proud to be here. Thank you.

MR. McTIGUE: Alison Hirsh?

MS. HIRSH: Present representing Comptroller Brad Lander.

MR. McTIGUE: David Kazansky?

MR. KAZANSKY: Present.

MR. McTIGUE: Victoria Lee?

MS. LEE: Present.

MR. McTIGUE: We have a quorum, Mr. Chairman.

MR. BROWN: Thank you. We will start with the funds and we go to Rocaton who is going to pick that up.

Proceedings

Amanda.

MS. JANUSZ: All right. So for the month of February in terms of general market results certainly, we did give a little back from the stronger rally that we saw in January to start the year. Looking down at the one-month column can see essentially slightly negative results across the board on an absolute basis, and in terms of those market results we did see a weaker month driven by a couple of things. One of the things we did see is the inflation numbers for the last couple of months revise upward. We also have the Fed hike rates, another 25 basis points, following along their schedule. Markets by the end of February had increased their expectation of where that peak Fed rate was going to land later in 2023, up by another 50 basis points or so. All of that led to weaker market results.

So for your Diversified Equity Fund which does hold the bulk of the assets in the Passport Funds, results for the month of February were down about 2-1/2 percent. You can see that was pretty even returns between the U.S. and non-U.S. equity components of that fund. The fund is still in positive territory, year to date up just about 4.8 percent year to date through the end of February. And the actively managed component did add about 1.6 percent above the benchmark, especially some of your growth-oriented managers that have benefited here so far in 2023.

Your Balanced Fund was also negative for the month of February down about 1.99 percent, although protected a little bit better than the equity option just given it is a more conservative allocation. That fund as well is in positive territory year to date, about 1.3 percent.

And in terms of the International Equity Fund for the month of February, down 2.8 percent and up about 5 percent year to date. In the international equity space, developed markets have fared better than emerging markets which have been a bit more negative here so far in the year. One of your best performing funds year to date is the Sustainable Equity Fund. It was down about 1.6 percent for February, but was up close to 8 percent year to date. That fund does have a bit more of a growth tilt. So especially in January, to the same extent in February as well we saw very strong results from the tech sector which featured heavily in growth-oriented fund. So that Sustainable Equity Fund did benefit there. And then your passive equity options are tracking their benchmarks as we would expect the International Fund does have a bit of fair market value producing impact that's causing that tracking error.

MR. BROWN: Thank you. Appreciate it.

Any questions for Amanda?

Great. We move on to the March 2023 market performance and I guess Devon Alexander.

MR. ALEXANDER: So I will be discussing the performance results as of March 20th, that's Tuesday, the benchmark report. So I guess we could say that is consistent with

Proceedings

March Madness, so we did see we some tension in the bank. We also some tightening in the credit conditions and that led to some varying performances across the board for all major asset classes. The Global Market Composite benchmark was down about 70 basis points, but year to date up 3.8 percent. Also down was the Diversified Equity Fund hybrid benchmark, down about .84 basis points but up 3-1/2 percent for the year to date. Move over to the Balanced Fund benchmark, we did see positive results for the month and also year-to-date performance of 2.28 percent. Down to Sustainable Equity Fund benchmark, we did see positive performance across the board for both the month and the year to date. And mixed performances for the U.S. Equity Index Fund benchmark, down about 1 -- down by 88 basis points for the month, but up by 3.58 percent year to date.

So the overall theme here for the month is varying performance across the board for all major asset classes, but despite the pullback in February we were able to maintain

Proceedings

a positive performance year to date so far. A little better news.

MR. BROWN: Thank you, Devon.

Any questions for Devon?

Then we move on to the strategic asset considerations and discussions, so I guess Ed.

MS. HIRSH: I think Steve is going to open it up and then pass. Oh, there you have Steve.

MR. MEIER: I apologize not to be here in person, but it's good to see everybody in Zoom this morning.

MR. BROWN: Good morning.

MR. MEIER: Sorry?

MR. BROWN: Just said good morning.

MR. MEIER: Let me kick it off before I turn it over to Ed. I am going to ask Ed Berman to take us through a presentation deck, but I just want to give you a couple of quick remarks for where we are in the process of looking at strategic asset allocation and, again, particularly following the change in legislation in the latter part of this last year that opens up the basket clause for a

Proceedings

higher allocation into those eligible assets.

So, first of all, we have established a timeline for this important work for 2023. Actually, Alison Hirsh took the line, showed the responsibility for putting the timeline down which we are adhering to. We have organized a team within the Bureau of Asset Management to spearhead the project which includes me, certainly Petya Nikalova and Eneasz Kadziela, the two deputy CIOs, also John Merseburg the asset class head to equities, Robert Feng the asset class head for public fixed income, and also last but not least Chief Risk Officer Ed Berman. So we have a team in place working on this proactively. We have also reached out to the plan's general consultants, obviously Rocaton/Goldman Sachs, to begin collaboration to really try to review and understand their capital market assumptions, in the way Ed puts it, to really understand the assumptions that underlie their assumptions as building blocks for a strategic asset allocation review. We have also been working with the consultants on a project plan internally. Actually Kate Visconti, our chief of staff, is working on that with me and others on the team to kind of put things in place so we make sure we are making steady progress. We are also planning for active engagement with trustees throughout the process and that will be part of the project plan.

As we reflected last month, it's certainly very important in terms of our focus and the hope and plan is we have this work completed by October. We really want to have these any changes and we want to pregame this. Obviously the decision rights are those of the trustees, but if there are changes in the allocations to private assets we would like to be able to incorporate those in our 2024 and beyond pacing plan for those assets and that process really begins November, December -- actually even begins in October. So if we can wrap it up by then, I think we would be in pretty good shape.

Maybe just take a step back before I turn it over to Ed. In early January I sent an e-mail to our asset class heads, included of course Chief Risk Officer Ed Berman, detailing these ten -- what I thought were forward-looking themes that I believe we should incorporate into our long-term strategic asset allocation, strategic planning. Ed actually took these themes and vastly improved on them and consolidated them into three broad themes that are much more focused in view.

And I am going to turn it over to Ed now to actually take you through a presentation through those themes and how he thinks about them to form a basis of the strategic asset allocation, again, trying to be more forward looking and, again, Ed will talk about how we intend to do that. I should also mention, we shared these obviously with Mike and others at Rocaton/Goldman Sachs and all the plan general consultants. So with that if there aren't any questions, turn it over to Ed for the presentation deck.

MR. BROWN: Thanks.

Any question for Steve?

Proceedings

MR. BERMAN: Thank you.

Next page, please. Thank you. So I think there is a lot of mystery about asset allocation, so we want to talk about what it means and the steps involved. But fundamentally one of the most important decisions that you make, as we well know, asset allocation determines about 90 percent of returns for the System. And as pretty much everything in finance, asset allocation is a blend of science and art, and I would say in this case it's more art than science.

So fundamentally there are -- I mean, there is a lot of technical jargon, but fundamentally there are three main steps in asset allocation. So first you come up with assumptions, meaning you project returns for asset classes forward five to ten years. Step Number 2, you decide which assets to put in your portfolio. And Step 3, you apply the statistical techniques to come up with the best allocation which yields the best return for level of risk.

Probably the most important step in this

Proceedings

process is the so-called long-term capital market assumptions. And we don't know the future, it's unpredictable and there are many different approaches how different teams come up with assumptions, but fundamentally on these themes there are two basic approaches:

So on the one extreme, people say it's all about the history. We can look at the past trends, past performance and just project it forward mechanically. Next approach is to say that the history is a poor guide and we will just come up with assumptions based on our understanding of the economy. I think in most -- in reality, most use a blended approach. But no matter what we use, history is our guidepost and what we would like to argue now is that we always say this time is different, but maybe it truly is and the history is not a perfect guidance for us going forward.

So usually long-term capital market consultations are based on about 20 to 25 years of history. And if you think about the past 25 years it obviously was a turbulent

Proceedings

time both in markets and politics and otherwise, but there are several key events that stand out in the financial history. So, first of all, we started this period with the dot-com bubble. You would say as traumatic as it was, it's your typical run-of-the-mill markets; markets on top, markets came down. It happens every 10 to 20 years; it's nothing usual about the dot-com bubble. A few years later, the Global Financial Crisis starting 2007. That crisis was unusual. Now we are talking about once-in-a-hundred year events. So we can go back to the 1920s to see something similar in scope and magnitude. This crisis is unusual. It took ten years to work out the problems introduced by the financial crisis and we don't know the future, but chances are for the next few decades we will not see it again. That was followed by the European debt crisis. Again, highly unusual event. You can say it was an extension of the Global Financial Crisis, highly traumatic for Europe, and probably not likely to happen again in the near future.

Proceedings

And finally today a combination of COVID pandemic, inflation, and war. We need to go back to 1918 to find a similar combination of macro factors.

Again, hopefully we will never see it again in our lifetime but no matter what, the past 25 years may be a poor guidance going forward. It may be a poor guidance in the sense of just mechanically projecting the returns. It's also poor guidance in terms of our opinion about the future. So think about the junior analysts in the 1990s. Now, these people are in their mid-fifties, these are the people in senior roles making decisions. Their opinions just are influenced by history.

So what's important for asset allocation? Can I have the next page, please. So again the world is uncertain, the future is unknown, so we talk about multitude of themes and approaches and ideas. But fundamentally I would say there are three building blocks that influence everything and these blocks are the inflation, the GDP, and the uncertainty. We will go through them in detail, but inflation is something that we are obviously living through now. It's clearly a traumatic experience; nobody likes inflation. It's actually not that common; inflations come and go. And if we look at the history of the world in the 20th Century, 21st, it typically comes and lasts four years and inflation is then gone, but creates lasting impact; so we will talk about why and what it means.

The GDP growth underlies everything, right? So we talk about GDP, which is global domestic product. The flip-side of it is the gross domestic income so that's a sum of all income generated by the private sector, by the consumers, by the government. This is our economy and this is income divided between private sector and public sector and that often determines corporate process and determines market returns and then the uncertainty. Again we will talk about because the world is always uncertain, but I will argue it's now more so than ever been. So for each of these three themes, we will try to answer three questions: First of all why it

Proceedings

is important, second of all what drives it, and third is how do we express this theme through asset allocation and that's -- as we go through, please stop me. I would rather have a discussion rather than presentation, so please stop me with any questions.

So starting from the top, inflation. So intuitively we all know what inflation is, it's just change in prices. Why is inflation bad? The truth is most people don't notice inflation until it reaches about 5 percent. Just empirically, consumers are uncomfortable with inflation at 5 percent. We know negative inflation or deflation is highly damaging for the economy, so most of the central banks adopted a policy of around 2 inflation. There are no consensus around this number; most economists will probably go to 3 to 4 inflation as like a bear regime. That said as bad as inflation is, what's damaging is the change in inflation; that is the uncertainty. So consumers hate it because it discourages consumers from buying consumer goods. Businesses hate it because it discourages businesses from investment and growing. Clearly inflation increases cost of servicing debt, so anybody who has a floating rate mortgage knows that first hand. And if it's a fixed rate mortgage probably, they are half right now. Inflation is even worse for small economies, usually emerging market economies, who rely on imports, specifically food imports. So high inflation may actually create starvation around the world, so there is real damage.

We talk about inflation being something uniform, but in reality there are ranges of inflation. So domestically even within our country like in the Northeast where we are, the inflation trends are lower than in the Southwest. It actually at the peak of inflation was about 8 percent. In New York State it was close to 6 percent. In California it was probably more like 10, 11, right, so that's also not helpful. The situation is much worse in Europe. So for example just today, Spain reported inflation came down to 3 percent from 6. At the same

Proceedings

time in Estonia, one of the smaller countries, inflation rose close to 20 percent. Think about the European Central Bank where they have a single rate, single-policy rate to fight such a broad swath of inflation; it's difficult. The point is it's this spread, the range of inflation, creates problems.

Inflation reduces real income so probably you all read about it that the real wages are not falling, keeping up with inflation; meaning that in real terms workers get less compensation, it means they have less money to spare so there is less consumption so less need to manufacture goods. So in the extreme case inflation, think about the 1920s, 1930s; it was a highly-traumatic experience. It's clearly damaging for anybody with fixed income; the pensioners come to mind. So inflation is not very helpful, but as bad as it is it's the deflation that we worry about. Historically, periods of high inflation are often followed by periods of deflation. Japan being an extreme case; they never emerged from the deflationary period. And if you think

Proceedings

about Germany in the first half of the 20th Century, so common narrative is that inflation created the transition from Weimar Republican to the Nazis. It's actually deflation that led to the Nazi party winning an election.

So with this in mind, so what drives inflation? Go to the next slide. So the short answer is we don't know. So it used to be in better times, simpler times like maybe 20 years ago where there was a dominant view of inflation, it was about all about the money so called Monetarism view. And Milton Friedman was the prominent economist who came up with this view. I think the consensus in the markets right now is we simply don't know. And I put a quote here on a slide of Olivier Blanchard, former chief economist of the IMF. It's a quote from about a month ago. He said: Inflation is fundamentally the outcome of the distributional conflict, between firms, workers, and taxpayers; it stops when the various players are forced to accept the outcome. It's more complicated than this. How many moving parts, we don't know what

Proceedings

drives it; we know it's here, we know it's damaging, and we know we have limited tools to fight it.

There are several ideas that we can propose that probably influence inflation. One of them is the role of globalization or regionalization. So the rise of China in the 21st Century was probably one of the most important drivers of the environmental flow of inflation and ultimately it's a way of arbitrage, as more manufacturers moved to China clearly prices came down globally.

We can talk about the role of the state and it can be either through monetary policy which is usually the central banks that's in the news, every time Powell has a press conference we all listen very carefully, or it could be through the fiscal policy and think about the almost the 5 trillion stimulus that the U.S. injected due to COVID. Think about the IRA Act from the current administration. Fiscall policy has not so well understood the role of inflation, but it clearly is there. So I have seen estimates from the 5 trillion stimulus. Some economists say it's about half a point of inflation; some people say all of inflation came from that. There will be a lot of Ph.D.s we can base on this for many years to come. As of now, we just don't know. It's inflation influenced by the presence of global assumption, demand, and income distribution. And income distribution is important. We all hear about increment wealth inequalities, but what it means is more wealthy people accumulate more income but they actually don't consume. If they don't consume, they don't buy stuff, prices come down or don't come up as such so more income inequality means less inflation.

Geopolitical conflicts obviously create a very strong influence, as we see in with the current war between Russia and the Ukraine. There is a huge concern about Taiwan which clearly I am not going to go into this, but I am sure everybody is familiar. And the last thing to highlight is the role of the U.S. dollar has a central role in the global finance system. I will just say it's a complicated role, but that clearly has an impact on inflation.

So how do we express inflation views in the asset allocation? Go to the next slide, please. And here we talk about two extremes; the environment of low inflation versus an environment of high inflation. Starting with lower inflation, that's the world very much familiar tor us. Talking about 2010 and the past decade, so in an environment of low inflation the stock/bond correlation is usually negative. What it means in reality when equity prices rally, bond prices fall. It's helpful for the portfolio construction; it helps to -- that's the foundation of this standard 60/40; 60 percent of stocks, 40 percent of bonds where bonds create some kind of cushion for the portfolio and helps absorb the shocks. At the same time in the low inflation environment, interest rates tend to be low so the role of fixed income in the portfolio is reduced again. All of this is less income, it's more what we call risk diversified. So it has to cushion the blow,

Proceedings

but it's not much in terms of positive contribution from fixed income.

And on the equity side, it's the growth stocks that produce the most. Think about the Internet stocks, think about all these venture capital stocks, and obviously the private investments. So the reason private equity took off after the Global Financial Crisis, again the question people hotly debate. But it's probably fairly clear that the low interest rate environment was very helpful to the growth of private equity. On the flip-side of the equation the high inflation, the stock/bond is correlated; meaning stocks and bonds move together. We have seen it in the past years so every time we talk about the quarterly results we will comment how both stocks and bonds sold off, at the same time how that's unusual. That's a high inflation environment.

On the positive side, now treasuries produce real returns. High yield delivers 8, 9 percent. So we are getting real carry, real contribution for the income, but on the equity

Proceedings

side we need to change our exposures. Now it's the defensive the value stocks that help. Growth in the Internet stocks, technology will probably underperform in this environment. And finally real assets, think infrastructure, real estate, may be helpful. It's a little bit cash dependent, but generally speaking we see real assets may help with this environment and under some conditions commodities may benefit. So that's inflation.

So let's talk about the second thing, GDP. So here it's important to say that we are talking about the real GDP growth, not what's usually quoted in the news. What we feel like 3, 4 percent. It's the yield and the inflation, right, so we are talking about yield. That's what matters for financial markets, it matters for everyone. This is the total income produced by the economy and simply said: Rising tides leads to slow boats. In the expanding GDP, expanding economy rather, consumers have more money. They consume more, companies produce more, companies invest. It's a self-repeating

Proceedings

cycle; life is good, everything helps, and nobody likes recessions. But what's important for markets is that the rate of GDP growth influences central bank policy, so we have the Federal Reserve staying on the sideline watching the economy. If it overheats, if it's getting too good, they will raise rates; then when things go not too good, they will cut rates. So some of it is managed.

Clearly expanding economy will create positive environment for equities. That's not a big surprise, but the important thing to remember is that the long-term rate of the GDP growth ultimately determines the interest rates. And loosely speaking, we think of the rate on a 10-year treasury over the long-term converging to the GDP growth, right. So that's useful, say we expect the GDP to grow at 2 percent; that will roughly be the rate on the 10-year and kind of gives you an idea of what to expect from the returns of fixed income that actually influences all other parts of the puzzle.

So what drives the GDP? What determines

Proceedings

the GDP growth? And can I have the next page, please. So here we have a single equation. For this presentation it's a simple equation and simply put: The GDP growth is just two components; it's a growth of labor and a growth of productivity. There is nothing else to it. Let's take it in steps. Let's first focus on labor growth.

So labor growth, first of all, it's about demographics. So we are all worried about the fertility rate declining across the board, so kind of the neutral rate is 2.1 child per family. We haven't seen that rate of growth in the developed world for a very long time. Probably nowhere outside of Africa we see population growth, fertility rate at this level. We are actually doing not so bad; I think we are close to 1.8. One of the worst countries is South Korea. It's about one child per woman; it's like disaster. China is not doing too well, probably as a result of one-child policy. Japan is not doing too well, Western Europe not doing too well. It's not helpful for the economy.

Proceedings

On top of it, we have -- and by "we," I mean most of the world -- really aging demographics so many people leaving the labor force. What helps us is labor migration. So clearly migration, immigration into the country will increase the supply of workers and consumers at the same time. The retirement age, it's a big question, right? So we see a lot of people reentering the labor force either part time or full time. And clearly it's what's happening in France right now, it's all about retirement age from 62 to 64 and it created a firestorm. But another important factor is the labor force participation or, loosely speaking, how many people actually participate in the labor force. And there is this one number, I think it's about 62.4 percent right now. There are variations so there is variations by gender, by race, and certainly the labor force participation came down significantly during COVID and we still haven't recovered. We are still running a few basis points below the pre-COVID participation labor force

Proceedings

participation, meaning less people actually willing to work or entering the labor force for various reasons. So less people working is low GDP.

The other side is productivity and the productivity is quite simply the amount of output produced by one worker in one hour of work, which is a very blunt tool. There is no such thing as average worker, there is no such thing as average output, but it's not something we can measure and we know it's declining very fast. Again, we do not fully understand why productivity is so low and declining. I think it was a very popular think that just started in 2010 of an increase in productivity growth that just never came to be. We know productivity reached its peak around mid-1940s most likely as a result of the second world war and there were simply fewer workers working longer hours. We know that there came a spike during the periods of technological innovation, but it came with a strong collab. Like the electrical bulb was patented in 1870-something and the widespread of electricity only occurred about 50 years later. The steam engine took about 50 years before the ships actually came to be and had an impact. So we saw a productivity blip, a small increase when computers in technology came about; it was actually lower than expected and productivity has been declining ever since. Anybody can tell you, like this presentation talking about today we are spending significantly more time preparing the layout than preparing the content. So the content came about in probably about two three hours; the layout took several weeks. In the past there would be a dedicated person doing this presentation; now we just are all dedicated people. So technology does not necessarily translate into better productivity. Part of it will just confuse, every time there is a new product we need to retrain. Technology is a big factor for consumers. So technology, artificial intelligence, will it create more productivity growth? We don't know.

The other part I want to highlight here

Proceedings

is the large increase in trade imbalances. Again we know that the United States, the UK, Canada, you, know there is a trade deficit. Most emerging market countries and Germany as well are run a surplus. It creates a way of labor arbitrage when we are shifting productivity into low-wage locations. There is less incentive for technology growth; it's not helpful for productivity. So many factors go into this. What we do know is productivity is low and declining, and we know GDP is not growing as fast and it has consequences for asset allocation and for your portfolio.

So how do we express it in our strategic allocation? So next slide, please. So let's think about the two extremes, the slow growth environment and fast growth environment. So in the slow growth environment again think about pre-COVID days. Interest rates were low, so less attractiveness of fixed income. Again, growth equity will probably benefit more than the value stocks; private assets will have a tailwind. Again, it's not surprising that private assets perform so

Proceedings

well in the past decade and unfortunately slow growth environment is more favorable to bubble formation. Think about crypto. I am going to discuss it because it's always a controversial subject, but think about the dot-com bubble. Bubbles come and go; they are not necessarily bad for the economy, but create a lot of volatility for the portfolio and doesn't help the returns. On the flip-side of the equation in a fast growth environment we can expect interest rates higher, we can expect better performance from equities, we can expect value and small cap stocks to outperform, and we can expect hedge funds deliver better performance and more stable performance.

And finally, Theme Number 3, uncertainty. Go to the next slide. So we often say that the world feels more uncertain than ever before. Maybe there's some psychological bias; it's actually something we can measure. The World Uncertainty Index, you can go on the Internet and see it. It's maintained by the IMF and the World Uncertainty Index almost doubled from the

Proceedings

1990s. So it's real, it's there, and it will probably continue. When we think about radical uncertainty the main things we know about the so-called known/unknowns so we know that the climate is changing, we know how the climate is transitioning. We do not know -- we can make ideas, but ultimately we do not know what will be the impact of this climate transition on the economy and on the markets.

Chinese economy developed very strongly in the past 20 years. It started from emerging markets, right, it's joined WTO; its economy is now either the Number 1 or Number 2 economy in the world, depending how you measure. But it's a very peculiar point in history and the Chinese economy is in the process of restructuring; it's not clear how the restructuring will go. As China has developed in the past there is a lot of examples from Japan, from the United States, from the Soviet Union. So there are many blueprints for China; there are none at this point. We know the restructuring of the economy is unknown. We do not know how it will play out. Geopolitics, it's everywhere. Enough said.

The role of the U.S. dollar in the future monetary system, so the U.S. dollar right now is the global currency. There it's -- probably the status is somewhat safe for the next five years. It's a separate discussion I am happy to have, but chances are it will shift at some point. We don't know how and we don't know what the consequences are of the shift.

Natural resources, access to natural resources, there are two countries in the world that can be self-sufficient in terms of natural resources; United States and Russia. Every single country in the world needs to secure access. So what's happening in Europe right now, the result of the war, it's been in the news. Europe did well this winter. They managed to provide enough heating; worry about it next year, the next winter. This winter was very warm, but access to natural resources is a serious concern. It will create potential instability in the future.

Proceedings

The globalization of national politics. So whoever follows national politics domestically will know everything about where we stand. The truth is we are not unique. The same thing happening globally is happening in Brazil, in France, in Germany, in Italy, and Poland. It's hard to find a country where it's not happening. Artificial intelligence is developing extremely fast. It's a huge unknown; it's something that never existed before. We know it will be transformative; we just don't know how. And it's the uncertainty about the dynamics in private and public markets. Think about the pre-global financial crisis environment. So private equity was a fairly niche asset class. Fast forward to today, private equity is about 10 percent of the domestic markets; it's not an niche class anymore. How the private and public markets will play out in the future, how they will shift, we just don't know. We can make some guesses but one thing we know, it's an uncertainty.

And finally there is a huge box on other

Proceedings

side of the page, the unknown unknowns and that's something we need to worry with. Think about 2019, just a few years back the left-hand side of the page would have almost the same. The right side would include the war, major pandemic, and inflation; nobody could have foreseen it. The future is unknown unknowns.

So why is the world getting more uncertainty; is it an accident or something behind it? So we have the next page, please. It's actually not an accident; it's a natural evolution of the world. It's a reflection of geopolitics. I would say, first of all, the rise of China had a lot to do with this. So as I mentioned before, China went from being a niche emerging market with a huge number of people living below poverty to a major force. So China is the kind -- or rather the development of China is kind of a lot of things that were happening in the world before starting inflation, domestic politics, international politics and it will influence the world going forward. The unresolved regional conflicts; we don't see them in North America, but if you step to Europe, to Asia, to Middle East, to Africa there are a lot of conflicts. Again Russia-Ukraine is one of the bloodiest, but unfortunately not the only one. Access to key natural resources, I mentioned before there are only two countries self-sufficient. But the demand for natural resources keep shifting, so now we are looking for rare earth materials. They were not as much in demand just 20 years ago. As technology changes, the demand will shift as well. Oil will probably become less important; now we will look more for wind. And finally it's the rising income and wealth inequality, so it's actually a highly destabilizing process. I like to think about income inequality domestically as there are two ways to capture GDP. The wealthy has lower tendency to consume. The less wealthy population makes up by borrowing, so we have an increase in debt. We have a reduction in consumption. Altogether it spells more instability. There is a lot of growing

Proceedings

imbalances between the nations. So the United States has a deficit and China has a surplus. If you take a step back, it's actually not the natural state of the world. So naturally we expect the developed world to run a slight surplus, the developed countries to be a provider of capital for emerging markets; that's not how the world is functioning right now. It creates instability, creates uncertainty. Global warming, again it's unfortunately here, it's happening and we don't know how fast it's moving. We know it's moving, we don't know how it will come and what the consequences will be. We know it will be bad. Energy transition, again it's probably difficult to manage so we obviously want to transition away from oil but want to do it in a more managed way, not to kill the economy meanwhile. We need to have oil to provide for the renewable energy; we cannot turn it off. And, again, the impact of artificial intelligence. Hope everybody has spent some time with ChatGPT. It's transformative technology. It is a source of

Proceedings

uncertainty.

So what we can do about it? How can we express it in our process and what's the meaning of this uncertainty for the SAA? There are things we can do. So, first of all, we need to be diversified and flexible. Diversification is important so we don't know which part of the economy in markets will benefit and which parts will suffer. Being diversified and flexible gives us a chance to pick the winners and cut the losers. It's a question of how often we view strategic allocations. So this kind of exercise, it's more of a question of we would like to include in the current SAA exercise. Traditionally it's done every three to five years. Maybe it needs to be done every year, maybe it needs to be done every ten years, but it's one of the levers we have to address the uncertainty and factor into our process. We may explore broader use of active managers. We give more flexibility to adjust and adapt to the shifting times. We may explore new opportunities through alternative asset

Proceedings

classes. I don't mean just simply private assets. I want to say crypto not because -- I am not advocating it, but maybe it's commodities, maybe it's systemic strategies, maybe it's hedge funds. It's just keeping an open mind and seeing what else is out there and finding the best ways to express the uncertainty, the ability to express tactical views. Again I am not advocating this, but it's one of the levers we may explore. And finally very important is engaged staff and ongoing education. As the world is shifting, we need to stay on top of it. We need to understand what's happening in the markets and what's happening in the economy.

So let's bring it all together. So talk about these three themes, so on the next page -- can we have the next page. So that's where we bring together all these. Staying with the two themes, inflation and GDP. So all these directions horizontal, we have GDP slowing. Starting at the vertical dimension is high inflationary rates and that creates four macro regimes. In the upper left corner you see

Proceedings

stagnation. So that's where the growth is lower and inflation is high. Think about 1980s. That's probably not the environment you want to be in, but it's not impossible. But again winners or losers so in the stagnation environments what helps rates because rates product, treasuries investment grade high yield, credit in general will probably benefit and provide positive returns, growth equities and most importantly private assets. What will get dropped, probably commodities which is less important for you because you don't have any exposure to commodities. Value equities. Value equities is important because a lot of active managers tends to take value tilt; it's the natural exposure to active managers. Emerging markets probably will underperform and hedge funds are not expected to deliver good returns. In the bottom left we have stagflation and that's slow growth and high inflation. Again I think I just meant to see -- I called stagnation was 1980s and I apologize. Stagflation was the period of 1980s. Probably the only place

Proceedings

where you want to be in a stagflation environment, cash and cash-like products. Pretty much everything else will go down. And, again, that's not the type of happy place for many reasons, where we you want to be in the so-called Goldilocks. Upper right corner think about the 1980s, it's the Clinton era, the proverbial soft landing; everything is hoping for the elusive where everything is good. You cannot make a mistake; no matter what you buy, you benefit. Probably the only negative part would be cash exposure and hedge funds might underperform so hopefully that's where we end up, and finally the overdrive where the growth is accelerating and inflation is running high and again there are winners and losers. One thing to understand is the overdrive is probably not a very stable environment mostly because of the regulatory response. So the central bank will probably do its best to kill this environment as soon as possible. And finally on the uncertainty, our third theme is the uncertainty. And the point of this third theme is we actually don't

Proceedings

know where the world will end up. The uncertainty is we don't know which one of these four quarters will be the next five years. And you can see we need to make an educated guess which we will between the consultants, BAM, your involvement, but the uncertainty is there. You see the different assets perform differently and that's unfortunately the world we live in.

And I will stop there and open for any questions.

MR. BROWN: Thank you, Ed. I appreciate it. I think Robin might be out there to opine.

Rob?

MS. PELLISH: Hi, everyone. It's nice to.

MR. BROWN: How are you?

MS. PELLISH: Good. It's nice to see everyone. And thank you for that presentation, very interesting and very broad and encompassing. So you focused very eloquently on the sources of uncertainty and different market regimes and factors that lead

Proceedings

to asset class success and failure. But given the radical level of uncertainty that everybody agrees exists, what does that mean for the asset allocation assumption process? And also even in -- I would say equally interesting to me at least is what does that mean for the establishing of objectives for the pension fund? So the pension fund is clearly here for one purpose, to meet the benefit commitments that have been made to members. But there are a couple of levers we can pull which are the level of risk, expected risk we are willing to tolerate, and our return objectives. We had talked earlier about maximizing the level of return per unit of risk, but I might suggest that first we should think about given this radical level of uncertainty, are we comfortable with the level of risk we are taking whether you are defining that as liquidity or volatility? And can you comment about how the board should think about the objectives for the fund and how we are going to establish those objectives in terms of examining the level of risk and liquidity

Proceedings

that we can target over the next five years or so?

MR. MEIER: Robin, it's Steve Meier, if I can jump in.

So this is really a thought-provoking exercise. It's really the type of things we think we should be incorporating into our thinking in terms of being long-term investors. Part of it is to engage with general consultants to see how they think about these things and do they incorporate some of these items into their forward-looking capital market assumptions. Again Ed very appropriately talked about the fact that a lot of the assumptions are backwards-looking and I know there is some quantitative processes that are put in place in terms of trying to have them be more forward-looking, but I think the question we raised is really the last 25 years really the best time frame to look at to really base your assumption on. And there are a number of things in the markets that are really fundamentally changing how we look and think about things and the risks associated.

So those are all good questions. Those are the type of questions -- which is why we shared it with Rocaton/Goldman Sachs and other general consultants; how do you guys think about these, how do we think about -- is there a better way to incorporate these longer-term themes into this strategic allocation process.

I would like to answer very clearly right now these questions; it's I don't know. I don't think anyone knows again given the level of uncertainty, but I do think these are things we should be thinking about. And I think when Ed talked about the process going forward about strategic allocation, about potentially providing more flexibility, tactical views, again not advocating a position but are these things we should be thinking about again in consultation with yourselves as well as certainly the trustees, you know, how do we be more flexible around these levels of uncertainty. So I don't mean to push it back to you but, I mean, that's -- it's more of a process of evaluating alternatives going forward versus having

Proceedings

concrete, these are the things we should be talking about. This is how we think it spills out in capital market assumptions.

MS. PELLISH: So I agree with all of that. There is no crystal ball and I know the other consultants try to think forward and not rely too much on history, although history provides some interesting information. I guess the question that pops out at me given the level of uncertainty and unknowns is, should we be thinking differently about the level of risk the fund is going to take over the next five years? And I am not prejudging whether the answer to that is yes or no, but uncertainty equals risk, right? So does that mean that we want to think differently about the level of risk that this fund will target? Because we have a fairly high level of equity risk in the portfolio, right?

MR. MEIER: At some point, yes, I agree and I am not prejudging. That's an excellent question to ask and one we think we need to put our heads to in terms of answering.

MS. PELLISH: Great. Thank you.

Proceedings

MR. MEIER: Robin, this is also something that as pension managers and consultants as we go through this process, where everyone kind of follows the same assumption whether they are capital market assumptions, backward-looking assumptions. We massage them a little bit with quantitative techniques to be a little more forward looking. We may try to incorporate some level of expectations but, as you know, any forecast is going to be wrong. And any forecast ten years is going to be really subject to a varying wider degree of potential inaccuracies. So I think it's a challenge upon us to really think is there a better way to do this and are there other things we should be thinking about. I think questions around risk, flexibility, tactical decisionmaking around these, I think these are things we should be talking about with the trustees and with each other.

MS. PELLISH: Thank you.

MR. BROWN: Steve, it's Tom. I am sure we will be discussing going forward the impact

Proceedings

of the fossil fuel divestment that we did. That will be in the discussions, what impacts?

MR. MEIER: Absolutely, the impact on the portfolio. I mean, really the tracking error, we can look at expectations for that energy transition that Ed talked about. I don't mean to make a judgment whether it's wise, divestment is wise or not, but I do think Ed's point is we are going to need to rely on fossil fuels throughout the transition. And I personally believe the transition is important and something we need to focus on, but I believe it's going to take longer than a lot of people expect. And I do think we are going to continue to use fossil fuels to help build up those alternative sources of energy and maybe that's a transition away from oil into natural gas and into something that's greener. I, you know, really believe it's something we need to focus on, but I think it's going to be a challenging road ahead. Some of the other aspects of fossil fuels and climate change, Tom, also reflect around water scarcity, food scarcity,

Proceedings

immigration, migration out of areas that may become uninhabitable based upon the heat and dryness. So there is a whole bunch of things I think we should be thinking about. Without clarity, Robin's point is a very good one. There is a lot of uncertainty out there and I don't mean to just pitch more questions at this, but I do think it requires some thought and now is a great time to be thinking about these issues.

MR. BROWN: Thanks, Steve. I think Dave Kazansky has a question.

MR. KAZANSKY: Yes. So I think building on something that Robin mentioned and kind of was one of the big themes around uncertainty and how much history really is of any use going forward, Like it really feels to me that especially since COVID -- or maybe just because of COVID I am more hyper-sensitive to it, but it really feels as though everyone continuously seems to be surprised at the way things are happening more so than maybe five years ago or ten years ago where it felt like there was a more oh, this is probably going to

Proceedings

happen and people patting themselves on the back that they were right. It feels like there is less of that now. So how much -- I mean, how much of a balance are we trying to set between the uncertainty of what's about to come and the fact that history may not be as helpful in understanding how to navigate that uncertainty as it used to be.

MR. MEIER: And, David, to your point I think the world has changed obviously very dramatically since 1918, which is the last time -- we have had wars in the past. We have had inflationary periods in the past. This is kind of unique where we are coming out of a global pandemic at the same time we have a war in Europe and high inflation pretty much around the world. So it does seem as though now is, you know, I will -- the hair on the back of my neck bristles when people say it's different this time because it usually isn't, but it just feels as though we are at an inflection point. And maybe it's coming off a 40-year secular decline in rates bottoming out in zero interest rates which caused some excess to build up into the financial system and asset prices. I will ask Robin to weigh in as well as Ed to that question, but that's a really good question. And it just feels -- and I have been doing this for almost 40 years now; it does feel like we are at an inflection point. Not to say it's different this time; it just feels like it's changing.

MR. BERMAN: If I may add: So you are absolutely right the world is uncertain, that's clear. That said in terms of market information, we typically can go back about 20 years and that's simply because a lot of stocks that currently exist were not even issued, were not IPOed back then, right, so we can use this period. If we use it carefully we can actually find periods of inflation/ deflation, slow growth/fast growth, definitely crises. So we can use this information if we use it carefully. In terms of economics and understanding the economy in general, we can go to the mid 19th Century. We have reliable data that provides a lot of guideposts of understanding. The biggest wild card is

Proceedings

actually the central bank. The central bank learns from the past and every time the response -- not just the Federal Reserve, but other central banks the response will be different every time. So the past crises are part policy, part regulation and that's what keeps changes the world. So I think the answer to the question is, yes, we can use history as a guidepost. We cannot use it blindly; we need to go very carefully, but there is plenty of information.

Another point I want to make is I would take any systematic process over anything discretionary, right, so as long as you apply the same rule over and over again in a consistent way, as long as you have a solid process, chances are you will come back. That's the whole point why we are doing this strategic asset allocation. So we argue on fringes and we will, but whether the private equity needs to be 8 percent or 7-1/2 -- I will just make up numbers -- it's important that we have this conversation, important that we argue, important that we go through this

Proceedings

process. Because fundamentally it's the same process, we just need to make it better and to me that's the key to addressing the uncertainty. If you have a firm systematic process, that's fine.

MR. KAZANSKY: Great. And another question -- not so much a question, something to think about when we are doing asset allocation is around the concept of active management. I think I believe one of your slides said we want to take a broader use of active management and, I don't know, it seems to me that active management generally speaking -- and I apologize to anyone who is an active manager who is listening, right -- either don't do great or really doesn't do great. Like it doesn't feel as though in this Modern era that -- the advantage of being an active manager, especially in the bigger sectors where so much information is available, that real active management doesn't seem to be paying off the way it used to. I just kind of want some really thoughtful assistance on whether or not active management

Proceedings

is really going to pay for us in this next allocation.

MR. BERMAN: So my point on active management, I was not advocating for active managers. My point was it's one of the considerations we need to think about it. There is a potential for active management to address this uncertainty, but potential doesn't mean that it will. And, yes, you are absolutely right that active management as a group underperformed strongly the markets. That said, obviously scattered managers performed better. I would like to bring up a question not just active or passive but like how many active managers, so two dimensions to the problem and exactly one of the questions we are looking at and talking internally with Steve and the rest of the team about the role of active management. I think it's one of the questions we need to address as part of this exercise.

MR. MEIER: I will ask Robin to weigh in as well, but I agree. I don't think there is a foregone conclusion, Dave, that active management is necessarily delivering the returns that we expect consistently. To the contrary. I do think that's part of the assessment we should go through in our asset -- in our asset allocation process, is the active passive mix. But, Robin, what are your thoughts?

MS. PELLISH: My thoughts are aligned with those of David's. This board has been inclined where possible to use passive, primarily passive management, in large publicly-traded asset classes. And there are certain large asset classes, you know, some fixed income for example, where the fees are low and there could be arguments that certain asset managers have information advantages, but I think this board has a healthy skepticism about active management and I think that's served it well.

MR. MEIER: I share that skepticism.

MR. BROWN: Thank you, Robin.

I think Anthony Giordano has a question.

MR. GIORDANO: I really enjoyed that presentation. I think the 25-year mark is

Proceedings

what everybody is targeting because 22 years ago is the last time stocks and bonds were correlated in a downwards spiral, so it seems to be interesting. I follow a macro-research provider on a daily basis that kind of calculates, so I have two questions within the context of the presentation. I follow this firm, they do 150 data points every day but their key element they look at is volatility and weight and GDP growth decline; that seems to be the key indicator. So I was curious how you guys look at that in the context of your macro assumptions. And then as I have been looking at their data and they have been on point in terms of predicting, but how does that -- as a pension fund trustee, how do you translate that data -- which they have been on point pretty much calling all the dips up and down, but how does that correlate to long-term investing in terms of your role in the asset allocation process? I mean, we can risk-on/ risk-off a little, but on the whole shouldn't we kind of have a longer plan than what's going to happen in the next, you know, year?

Proceedings

MR. BERMAN: I will agree with you it's all about the time scale, so in the long run it all washes out and the truth is that volatility has to stay fairly low in the markets. So we now have fixed income volatility at some exorbitant level similar to 2008, it will probably not stay this low for very long. The truth is if you look at the VIX which is a measure of equity volatility, it typically is around below 20 like 80 percent of the time, right, so over the long period of time volatility with high market selloffs, they usually reverse and usually the problem corrects itself. It's actually fairly unusual for macro forecasts to be based on volatility because volatility is how fast things change. Usually macro concerns more risk which is extreme selloffs that correlate with volatility, but not necessarily the same. But the GDP growth is definitely one of the main wild cards and that's the foundation of everything and that's the big gorilla in the room, right.

We also have a long-term investment

Proceedings

horizon hand on this in terms of how we think and you indicated we talked about in one year. Good question. And the real issue is around the ability to make tactical trades. We don't do that now. We strictly adhere to the targets that are given us. If there was a decision made by the board of trustees that you would want us to start being more tactical in that allocation process and have, you know, decisions or positioning within say a 12-month horizon at the margin, we can do that. We are not set up for that now. I agree with Ed, I think it would require a systemic and probably a quantitative approach. But within the Bureau of Asset Management we are not actively in the market, we are not underwriting new deals, we are not looking at daily flows into and out of bond and stock markets the way that say other players would be that are actively managing assets inhouse. So we would really need to think about how we can possibly represent those tactical bets in the portfolio in a strategic systematic way, but as I said it's food -- it's certainly something to

Proceedings

discuss and think about, but it's something we are not set up for at this point.

And I'm sorry, Robin, I didn't mean to speak over you.

MS. PELLISH: Thank you.

I think expressing tactical views is an art that's been successfully done by a very limited number of players. And those guys, those people are set up exclusively to do that and structured in a completely different way. It would be quite a governance and change to be able to incorporate tactical views, but I go back to the last thing I want to say and I don't want to be redundant and -- but I go back to the fact we can't predict returns, we can't predict the economic regimes we are going to be moving into. We can't predict macro shocks and macro-political events.

So what can we focus on? We can focus on the kind of risks that we are willing to take. We have to take risks to generate return. We have to generate return to grow the assets to meet benefit commitments. We can't rely exclusively on contributions, so

Proceedings

therefore I think the decision we are looking at is what kind of risks we are willing to take and how much of those risks. And that's difficult to predict but, you know, if you look backyards at history, risk volatility is much more consistent over multi-year time frames, is much more consistent statistical return, infinitely more consistent. So given that we can't predict returns because we don't know what regime we will be in, I would say we should be focusing on the kind of level of risks we are willing to take to generate necessary return for the fund.

And we are not return maximizers; we are just not. We are -- because we are not a hedge fund, we are a pension fund that has -- in which, you know, volatile return have a big impact on contributions and ultimately on members. So I would suggest that the board should be focusing on the kind of level of risk which is a much more intangible notion. That's why people like to focus on return, because everybody understands return and risk is a much more less intuitive and less

Proceedings

tangible notion of return. But that's the decision we are going to make in this asset allocation; what risks are we willing to take.

MR. MEIER: It makes sense and I agree with your comments around tactical decisions. It can be done; it's very rare and it tends to be inconsistent and there is a price tag associated with being able to build up those capabilities, assuming you can look into the flows.

MR. BROWN: Thank you.

Alison Hirsh has a question.

MS. HIRSH: I want to go back to the active passive conversation for a minute because there are obviously benefits being passive, lower fees and all that stuff. I just wonder what the cost benefit analysis is from a fiduciary perspective. We can't invest in as many emerging managers if we are entirely passive and often emerging managers seem to get higher returns than some of the bigger folks, so I don't know like what -- maybe this is just a question that can't be answered today, but is part of this process like what is the balance, like the appropriate balance of passive and active thinking about sort of the other fiduciary interests and goals that we have as a board?

MR. MEIER: I would say that's a great point. I think it probably won't be answered today, but I think those are the issues we are wrestling with. I also think passive and active, it's not a binary decision necessarily based on the entire allocation. It's more specific to markets where we think there might be an advantage that can be earned through better information, less market efficiency so I think nuances. Looking at large cap versus small cap ex-U.S. or emerging markets it's not to say there aren't capabilities to invest in a passive strategy across all assets, but to get back to Robin's point it's really about the risk relative to the expected return and is there an expectation that we are able to outperform to an asset allocation. And certainly, again, I don't think it's meant to be a blanket statement. Although, I know one or two large pension plans out there have

Proceedings

taken that decision to go all passive in public markets and really tried to differentiate the returns through active selection of investment managers in private assets. But, as I said, I think that requires a lot more thought and discussion. But great question.

MR. BROWN: Any other questions? Thank you, Ed for that presentation.

Next is the resolution to approve the net zero by 2040 implementation plan, so we agree we will defer this to when we come back into public session?

MS. HIRSH: Yes.

MR. BROWN: Do I hear a motion to go into executive session?

MR. KAZANSKY: So moved.

MR. BROWN: It's been moved.

Do I hear a second?

MR. BERGE: It's been seconded.

MR. BROWN: Thank you. Any discussion?

All those in favor, say aye.

Aye.

MR. KAZANSKY: Aye.

Proceedings

MS. LEE: Aye.

MR. BERGE: Aye.

MR. GIORDANO: Aye.

MS. HIRSH: Aye.

MR. BROWN: All those opposed say nay. Any abstentions?

We are now in executive session.

(Recess taken.)

MR. BROWN: So we are back into public session. Teachers' members have decided to lay over the resolution.

MR. McTIGUE: Just for the record, you are referring to Item Number 2 on the public agenda for pension fund?

MR. BROWN: Correct, and then we have a readout.

MR. SWINGLE: In executive session of the Passport Funds, there was a one-manager update. In executive session of the Pension Fund we received preliminary performance data; we received two private equity presentations. Consensus was reached on both and there was a discussion on an investment policy issue and the further discussion was laid over.

Proceedings

MR. BROWN: Thank you.

Do I hear a motion to adjourn?

MR. KAZANSKY: So moved.

MR. BROWN: Second.

MS. LEE: Second.

MR. BROWN: All in favor say aye.

Aye.

MR. KAZANSKY: Aye.

MS. LEE: Aye.

MR. BERGE: Aye.

MR. GIORDANO: Aye.

MS. HIRSH: Aye.

MR. BROWN: All opposed say nay. Any discussion?

We're adjourned. There is going to be an attorney-client session.

[Time noted: 3:06 p.m.]

Proceedings

C E R T I F I C A T E

STATE OF NEW YORK)

: ss.

COUNTY OF QUEENS)

I, YAFFA KAPLAN, a Notary Public within and for the State of New York, do hereby certify that the foregoing record of proceedings is a full and correct transcript of the stenographic notes taken by me therein.

IN WITNESS WHEREOF, I have hereunto set my hand this 11th day of April, 2023.

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YAFFA KAPLAN