

All the Credit[®], Ep. 49

Transcript

[Music]

Female Voice: You're listening to *All the Credit*[®], a monthly podcast series brought to you by PGIM Fixed Income, an active global fixed income investment manager.

Tom Porcelli, Chief U.S. Economist: Hi, everyone. This is Tom Porcelli, Chief U.S. Economist at PGIM, here with another *All the Credit*[®]. This time, I have the great pleasure of speaking with Guillermo Felices and George Jiranek, both are Global Investment Strategists. I've had the great pleasure of working with them for the last seven months. I would also give a plug to our probabilistic approach that we take here from an economic perspective. Guillermo and his team, they were really instrumental in crafting that entire framework for us and as someone who has been forecasting the economy for quite some time now, I have to say it's sort of a breath of fresh air tackling it from this perspective. So, on behalf of me, thank you for doing that, guys. So, we're here to talk about a note that the team put out not too long ago, and it was called *Assessing the U.S. Economy's Evolving Sensitivity to Interest Rates*. I thought it was an absolutely fantastic note. It's so wonderful to have such quantitative folks around that can really drill into these topics, particularly for me as a macro person. It's, again, incredibly helpful. So, George, why don't I start with you? And I think that there's countless ways of sort of tackling this huge topic, but it'd be really useful, I think, if you'd set the stage on what was in your head as you were starting to sort of gear up to do this.

George Jiranek, CFA, Global Macroeconomic Strategist: First of all, thanks for having us on. So, I think we'd go back to the end of 2021, and we realized that inflation wasn't transitory as many had thought, and the Fed had to raise rates and fight inflation. And it went much further than anyone thought they'd go and ended up raising 500 basis points. And given the magnitude of that interest rate increases, many would have expected a recession, as many did. And what happened was the economy actually accelerated. And over this last year, it grew over 3%, which is much faster than even trend growth. And it's puzzling because the recession call wasn't necessarily unwarranted. I mean, if you think about the curve, so the difference between long-term treasury yields and front-end treasury yields was the most inverted since the 1970s. That often signals that policy is extremely tight, and the economy weathered it quite well. And then, another thing that we went out in the piece for was let's just try to estimate what the magnitude of these interest rate increases would imply for GDP growth. And when we run that simple model, we found a recession. So, we think this is quite an interesting topic in the sense that the economy behaved much differently than we thought it would.

Tom: Yeah. It's funny. George, I've been saying this for quite some time. I know many of the economists that were out there forecasting recession, and I don't know anyone who's looking for any sort of deep or notable recession. I think everyone was looking for a pretty shallow slowing over the course of the last year or two. It's not that they got it wrong because I don't think that's the case at all. I think what they probably didn't appreciate was the magnitude of all of the other fiscal stimulants that were out there basically propping up economic activity. And yet in fairness, there were sectors that were basically feeling very recessionary in the backdrop. So, I think that context is really important, and it sounds like that's what this was an exercise in.

George: Exactly. So, the focus was trying to figure out what could have been the potential boost in the economy that gave a lift to GDP compared to what our models would have expected. And so, what we did was we zeroed in on each sector of the economy and split the economy into basically two parts: the interest rate sensitive part and the other being non-interest rate sensitive sectors.

Tom: So, define interest rate-sensitive sectors for us.

George: What we did is we took all the components of GDP, and we ran a macro model assessing each sector sensitivity to changes in interest rates. And if we found a statistically significant relationship, we would call that sector interest rate sensitive. And if we didn't, then we called it a non-interest rate-sensitive sector. And just to give an example is, you know, housing is very interest rate sensitive. You take out a mortgage before you purchase a home, whereas healthcare services are not. If you have a healthcare need, you go to the doctor. So we split the economy into two components, and what we found is non-interest rate sensitive sectors powered ahead as they're not as sensitive to interest rates. But the interest rate-sensitive sectors, while they declined, they didn't decline that much. So, they only contracted about 1% over this period, whereas in prior episodes of Fed hiking, they've contracted as much as 10%, 12%. So, what we have is basically the interest rate-sensitive sector is not responding as we thought they would.

Tom: The big discussion now is will at some point higher rates bite, from an economic perspective? I think that debate to me seems to be sort of ongoing. I mean, it's been happening for a while. I mean, are there any conclusions that we can draw from what's happened or the results of your note that can shine some light on that for us?

George: Yeah, the interest rate-sensitive sectors, what we did was we zeroed in on each one and said, okay, which sectors are responding as we'd expect and which aren't? Why aren't these interest rate-sensitive sectors contracting like we'd expect? And so, what we did is we divided the sectors into two basically, and the sectors that are responding as we expect were housing. We saw a big drop in residential investment almost immediately as interest rates rose. We saw a decline in industrial equipment investment as we'd expect. But interestingly, there were several traditionally interest rate-sensitive sectors that didn't contract. And here we found autos, trucks, furniture, other sectors that typically had been interest rate sensitive. And what we further found was there was an interesting evolution of the output or consumption of these sectors through the pandemic. So these accelerated during the Fed's hiking cycle. But if you look back before the Fed's hiking cycle, they actually registered a steep contraction around the beginning of 2021, which is consistent with the supply chain crisis that we saw. And indeed, many of these goods were engulfed in the supply chain crisis. So autos, of course, with the chips shortage, furniture, at some point, it took me and many people several months to get their couch. And so it's not to say that the U.S. economy isn't sensitive to interest rates. It's that there were unique features of the pandemic that maybe lessened the interest rate sensitivity of the economy as the Fed was hiking rates.

Tom: And actually, if I was to rephrase that whole idea, I would say it's not that the lags from tightening didn't work, but rather that the sectors that are not as sensitive to hikes was able to power through for an assortment of reasons, not the least of which was, again, probably just pent up demand. You think about healthcare in particular, you know, fiscal stimulus, which was able to sort of buoy it too. I mean, I think that there were a number of factors that really sort of pushed this thing through to this near 3% growth rate that we saw in '23. So that, to me, is an important idea that I think a lot of people are missing, is that tighter rates did impact the things that were incredibly sensitive to higher rates. But you had enough other factors at play that were able to mitigate higher rates on the things that are not as sensitive to higher rates.

George: Exactly. So another point that we made in the paper is not only did we have a really positive supply shock during the Fed's tightening, is demand for these sectors going into tightening was extremely strong. So consumption of these interest rate-sensitive sectors was well above pre-pandemic trends going into the hiking. And I think that speaks to the extraordinary amount of fiscal stimulus, the easing Fed policy, whether it's zero interest rates, asset purchases that really boosted demand. On top of a lot of these interest rate-

sensitive sectors are goods. And there was a shift in consumption towards goods from services, which still hasn't fully reversed. That has boosted demand for these categories.

Tom: That sort of framing of the conversation, I think, is what's being missed. So I think that's incredibly useful. So the economy grew at a 3% pace in '23 -- well, Q4 of a Q4, 3%. Full year was, I think, closer to two and a half. Given all the work that you've done, do you think that you could have a repeat? Again, just if you think about it from an interest rate-sensitive sector versus the non-interest rate-sensitive sector, could you have a repeat in '24 from a growth perspective? It's interesting. I think one of the implications of some interest rate-sensitive sectors responding and others not is it's kind of a staggered adjustment process to interest rates. And so not all at once are these interest rate-sensitive sectors contracting or moving in the same direction. And I think that gives the economy a certain amount of resilience that it might not otherwise have had it not been for the pandemic.

George: Of course, there is exceptional demand and a positive supply shock during this period. But there are several other factors that have boosted the economy's resilience. So if you look at consumer balance sheets, those are in aggregate, one of the healthier levels that we've seen. And of course, it's in aggregate, but we also see it across the income distribution. Prior to the pandemic, there had been quite a big disparity in the health of the consumer across different wealth and income cohorts. And what we saw from the pandemic was that all wealth and income cohorts saw a big improvement in their balance sheets. So that's one factor. And another has been the increase in labor force participation. So there is a big imbalance between labor supply and demand. And labor force participation surged right as the Fed was also raising rates. Couple that with increased immigration and you have a big boost in demand as well as labor supply, which helped the economy power along.

Tom: Definitely. And of course, as we've been talking about, you know, we think we're getting into better balance now in that regard in terms of labor. And so the hope is that as that persists, a lot of these big gains that we've seen will start to fade. And I think importantly, particularly as it relates to the Fed, that we'll see wage pressures continue to abate, which again is part of our bigger macro call. So I totally agree with that.

Tom: So, Guillermo, I think that this is probably a really good place for us to pick up because I think George and the macro framing that we've laid out here, it obviously lends itself very neatly into how we're going to think about this from a market perspective.

Guillermo Felices, PhD, Global Investment Strategist: Thanks, Tom. Thanks for having me. Yeah. So look, this period, this recovery in particular has been very, very unique in the sense that I think most investors thought it was going to play out in the usual way, meaning inflation is high, central banks tighten policy, and then asset prices will likely be derailed by that as investors expect recessions. But this cycle, you know, turned out to be very unusual. So with this piece and a follow-up that I did in terms of market implications, we tried to basically scoop out what are kind of the key differences and the key features that make this recovery unique.

Tom: I've never really had a great appreciation for the word "unique" until we've gone through this cycle, because there are a lot of things that I think are catching people off guard, is not quite right, because you can't be off guard on something that you're sort of completely unaware even exists. And I think that has really sort of punctuated this backdrop and all of the extra little things that have continued to sort of pop up, you know, the enduring element of fiscal stimulus, right? I mean, not to keep on coming back to that, but I think it's punctuated the backdrop in so many ways. And so I think all of this work has been absolutely fantastic. So why don't we drill in a little bit, Guillermo? Credit markets, do they completely ignore the risks of rising interest rates? This, to me, strikes me as a completely fair question.

Guillermo: Yeah, so I think an important observation to make here is that despite the perception of resilience of the U.S. economy, corporate spreads, especially in the US, if you look at IG spreads, for example, did discriminate by interest rate sensitivity in the face of higher interest rates. So if you look at 2022,

for example, you know, as the Fed started hiking interest rates, corporate spreads of interest rate sensitive sectors, so the ones that George described --real estate, home builders, automakers -- they widened significantly and significantly more than those in sectors that are less sensitive to interest rates like restaurants, health services, that sort of thing. So even though there was this perception of resilience, the market actually did discriminate by interest rate sensitivity. Now as headline inflation started showing signs of turning, so, for example, towards the middle of 2022 and more clearly in the second half of the year, I mean, albeit from very, very high levels, the spreads of those sectors started actually compressing quite quickly and actually outperformed those of insensitive sectors. But since then, they've actually stayed higher than those of interest rate-insensitive sectors. So, to me, that basically shows that these sectors are not fully comfortable with the headwinds that the high interest rates pose to them.

Tom: And so what do you think gets them into a state of comfort?

Guillermo: What I think is, again, quite unique or was quite unique about this recovery is the fact that you had these kind of staggered adjustments, right, across different sectors. So when you look at things top down as an aggregate, essentially what you see is that not just the economy, but also credit spreads were actually quite resilient. In fact, one of the most interesting features of this recovery and the market adjustment is that some indicators that are typically very good at predicting turning points or very good at predicting the tightness in credit standards and credit conditions actually didn't really work as leading indicators this time. But I think the main reason is that corporate spreads and markets in general understood that this staggered process of basically rolling recessions if you want, or this very unusual recovery actually meant that you had a lot more support at the aggregate level for risky assets than you would predict or that you would have predicted with these other cyclical indicators. So I think that's a key feature of the adjustment this time. So essentially, at some point, credit spreads tightened significantly while some of these indicators were still flagging red or yellow in terms of recession risk.

Tom: Yeah, I think that's such an interesting idea, right, because if it's wholly unique, certainly in any of the cycles that we have sort of operated in in our lifetimes, does that degree of uniqueness start to fade? I mean, do you get back to a more normal state? Or is this really a paradigm shift?

Guillermo: You have both to some extent. On one hand, we cannot deny that the usual relationships in macro and in markets still work in the sense that when interest rates increase so much because central banks are tightening, as they haven't done in a long time, that will put some stress on some segments of the economy. And of course, that will mean also higher discount factors in markets, and that should affect asset prices. So those relationships are there and we're not ignoring them. But at the same time, if you look at things that start to feel like a regime shift, I mean, they are for real and they may force us to reassess the way we think about the future. The obvious one that everybody's talking about is productivity. And I know that you're also really plugged into that story and trying to understand it.

Tom: I love the productivity story. It's one of my favorite right-tail risks. I mean, I've been saying it for a while, and as you both know so well, one of the key reasons we have a fat-tail risk scenario is because of productivity. I think that right-tail risk looks so appealing just intellectually and I think practically speaking.

Guillermo: Exactly. And when thinking about scenarios and the risks that we face both on the macro and markets, you have to consider both sides of the distribution. So the first point I was making was, you know, why do these lagged effects of monetary policy are still alive and kicking, and perhaps you should think about that left-tail with the usual kind of relationships in mind. But what about the right-tail, the one that you mentioned in productivity? I mean, then you have to assign some probability to the right tail. And it makes it incredibly difficult to predict asset prices, unfortunately.

Tom: Well, you're in good company because it's been incredibly difficult to predict what's going to happen from an economic perspective too. So, although I have to say in fairness to us, all of us, I think we've actually done a pretty good job navigating this unique backdrop, to say the least. Guillermo, I think -- and we touched

upon this a little bit, but it's probably worth exploring a tiny bit more. As we look ahead, what can you say about interest rate sensitivity of certainly the economy, but again specific to you, asset prices?

Guillermo: As I said, I think those relationships haven't gone away. The U.S. economy has turned out to be, you know, extremely resilient. It doesn't mean that higher interest rates don't matter. It just means that there have been some special factors that have allowed the U.S. economy to weather the storm very well. Now, if you ask me what is the outlook, especially for markets, I would say this economy in particular, the U.S. is in a very good place. So fixed income assets love moderate growth, so slowing growth, not recessions, but slowing growth is great. Falling inflation is also great, especially because that means that the Fed and other central banks can actually start thinking about cutting rates. And that combo is very powerful for fixed income. It's very compelling.

Tom: And again, I think as everyone appreciates, we obviously work very closely with Guillermo and the team on our macro narratives. And we've been pretty clear on our view that we expect three cuts this year. And I would say only three cuts this year. And the market obviously, I think, got way ahead of itself. But in an environment where the Fed is cutting a few times this year, maybe a few more times next year, I think that this idea of higher for longer, right, which we've all been talking about here at PGIM, I think that's a very sturdy idea. I put it in the context of people look at 5% on 10s and then 4% on 10s and we're 4.30 today. And I think they feel whiplashed by that a little bit. And what I've been saying is I think all that's happening is that this is literally price discovery. We're trying to figure out what higher for longer actually means. In fact, what it does not mean is that they're questioning higher for longer. I don't think that's what's happening. I don't think that's what the market is doing. I think the market is trying to understand where higher for longer sits. And I think that will be an ongoing process, which I think we've all seemed to agree on here.

Guillermo: Yeah, I know, you're absolutely right. This idea of higher for longer is durable. If anything, from a market perspective, I think what the market is struggling with at the moment is that spreads, and in particular U.S. corporate spreads have tightened significantly. So, from a spread level point of view, perhaps a lot of juice is already in the price or, you know, has been already reflected in that spread compression. But you have to remember these are spreads over safe rates, right? And those safe rates are significantly higher than what we had before the pandemic before this adjustment. So, it's a great environment for capturing that all-in yield.

Tom: Yes. And, you know, again, context, right, which, you know, you both have heard me say this a million times. The yields are much higher today, but yields are more normal today. They're much higher relative to the pandemic, but that was an atypical setup. I think people always forget about the Fed. The Fed has rarely cut rates to zero. It just so happens they did it twice in a decade during very big events: the GFC and then the pandemic. But short of a dramatic event, the Fed almost never cuts rates to zero. And so I think we're in a more normal state now than we were in the prior decade, decade and a half.

Guillermo: Exactly. Exactly. Completely agree.

Tom: So, I love this conversation. I love quarterbacking this for both of you. I've said this to you both, but it's worth me just saying it for our broader audience. We're lucky to have you both here -- your entire team. Guillermo has a team of a number of folks that have all worked on this. And I feel lucky to be able to lean on you all for this. It's incredibly valuable. I'm thinking up, you know, 60,000 feet, and you guys are somewhere between zero and 60,000, and it's so helpful for me to lean on you and have you around, so I'm so appreciative of it.

Guillermo: Thanks, Tom.

George: Thanks for having us.

Tom: Thanks, everyone. This was absolutely fantastic to speak with both Guillermo and George. And we'll look forward to another All the Credit at some point down the road. So, thanks.

[Music]

Female Voice: We hope you enjoyed today's podcast. Subscribe to keep up with the latest episodes of *All the Credit*®. For more insights on thought leadership visit pgimfixedincome.com. Have an idea for a podcast topic or guest? Email us at fixedincomerequest@pgim.com. or email your account manager or sales representative at PGIM Fixed Income. This podcast is intended solely for professional investor use. Past performance is not a guarantee of future results. All investments involve risk including the loss of capital. This material is not for distribution to any recipient located in any jurisdiction where such distribution is unlawful. This podcast includes the views and opinions of the authors and may not reflect PGIM Fixed Income's use. PGIM and its related entities may make investment decisions that are inconsistent with the views expressed herein. This podcast should not be reproduced without PGIM's prior written consent. No liability is accepted for any direct, indirect, or consequential laws that may arise from the use of any information contain in or derived from this podcast. PGIM Fixed Income is not acting as your fiduciary. The contents are for informational purposes only, are based on information available when created and are subject to change. It is not intended as investment, legal, or tax advice and does not consider a recipient's financial objectives. PGIM Fixed Income is a business unit of PGIM, the global asset management business of Prudential Financial Inc. which is not affiliated in any manner with Prudential PLC Incorporated in the United Kingdom or with Prudential Insurance Company, a subsidiary of M&G plc Incorporated in the United Kingdom, Copyright 2024. The PGIM logos and the Rock symbol are service marks of PGIM and its related entities registered in many jurisdictions worldwide.

IMPORTANT INFORMATION

Source(s) of data (unless otherwise noted): PGIM Fixed Income, as of September 21, 2023.

For Professional Investors only. Past performance is not a guarantee or a reliable indicator of future results and an investment could lose value. All investments involve risk, including the possible loss of capital.

PGIM Fixed Income operates primarily through PGIM, Inc., a registered investment adviser under the U.S. Investment Advisers Act of 1940, as amended, and a Prudential Financial, Inc. (“PFI”) company. Registration as a registered investment adviser does not imply a certain level or skill or training. PGIM Fixed Income is headquartered in Newark, New Jersey and also includes the following businesses globally: (i) the public fixed income unit within PGIM Limited, located in London; (ii) PGIM Netherlands B.V., located in Amsterdam; (iii) PGIM Japan Co., Ltd. (“PGIM Japan”), located in Tokyo; (iv) the public fixed income unit within PGIM (Hong Kong) Ltd. located in Hong Kong; and (v) the public fixed income unit within PGIM (Singapore) Pte. Ltd., located in Singapore (“PGIM Singapore”). PFI of the United States is not affiliated in any manner with Prudential plc, incorporated in the United Kingdom or with Prudential Assurance Company, a subsidiary of M&G plc, incorporated in the United Kingdom. Prudential, PGIM, their respective logos, and the Rock symbol are service marks of PFI and its related entities, registered in many jurisdictions worldwide.

These materials are for informational or educational purposes only. The information is not intended as investment advice and is not a recommendation about managing or investing assets. In providing these materials, PGIM is not acting as your fiduciary. PGIM Fixed Income as a general matter provides services to qualified institutions, financial intermediaries and institutional investors. Investors seeking information regarding their particular investment needs should contact their own financial professional.

These materials represent the views and opinions of the author(s) regarding the economic conditions, asset classes, securities, issuers or financial instruments referenced herein. Distribution of this information to any person other than the person to whom it was originally delivered and to such person’s advisers is unauthorized, and any reproduction of these materials, in whole or in part, or the divulgence of any of the contents hereof, without prior consent of PGIM Fixed Income is prohibited. Certain information contained herein has been obtained from sources that PGIM Fixed Income believes to be reliable as of the date presented; however, PGIM Fixed Income cannot guarantee the accuracy of such information, assure its completeness, or warrant such information will not be changed. The information contained herein is current as of the date of issuance (or such earlier date as referenced herein) and is subject to change without notice. PGIM Fixed Income has no obligation to update any or all of such information; nor do we make any express or implied warranties or representations as to the completeness or accuracy.

Any forecasts, estimates and certain information contained herein are based upon proprietary research and should not be interpreted as investment advice, as an offer or solicitation, nor as the purchase or sale of any financial instrument. Forecasts and estimates have certain inherent limitations, and unlike an actual performance record, do not reflect actual trading, liquidity constraints, fee. These materials are not intended as an offer or solicitation with respect to the purchase or sale of any security or other financial instrument or any investment management services and should not be used as the basis for any investment decision. PGIM Fixed Income and its affiliates may make investment decisions that are inconsistent with the recommendations or views expressed herein, including for proprietary accounts of PGIM Fixed Income or its affiliates.

Investing in the **bond market** is subject to risks, including market, interest rate, issuer, credit, inflation risk, and liquidity risk. The value of most bonds and bond strategies are impacted by changes in interest rates. Bonds and bond strategies with longer durations tend to be more sensitive and volatile than those with shorter durations; bond prices generally fall as interest rates rise, and low interest rate environments increase this risk. Reductions in bond counterparty capacity may contribute to decreased market liquidity and increased price volatility. Bond investments may be worth more or less than the original cost when redeemed. **Mortgage- and asset-backed securities** may be sensitive to changes in interest rates, subject to early repayment risk, and while generally supported by a government, government agency or private guarantor, there is no assurance that the guarantor will meet its obligations. **High yield, lower-rated securities** involve greater risk than higher-rated securities; portfolios that invest in them may be subject to greater levels of credit and liquidity risk than portfolios that do not. Investing in **foreign-denominated and/or -domiciled securities** may involve heightened risk due to currency fluctuations, and economic and political risks, which may be enhanced in emerging markets. Currency rates may fluctuate significantly over short periods of time and may reduce the returns of a portfolio. **Commodities** contain heightened risk, including market, political, regulatory and natural conditions, and may not be suitable for all investors. **Diversification** does not ensure against loss.

In the **United Kingdom**, information is issued by PGIM Limited with registered office: Grand Buildings, 1-3 Strand, Trafalgar Square, London, WC2N 5HR. PGIM Limited is authorised and regulated by the Financial Conduct Authority (“FCA”) of the United Kingdom (Firm Reference Number 193418). In the **European Economic Area** (“EEA”), information is issued by PGIM Netherlands B.V., an entity authorised by the Autoriteit Financiële Markten (“AFM”) in the Netherlands and operating on the basis of a European passport. In certain EEA countries, information is, where permitted, presented by PGIM Limited in reliance of provisions, exemptions or licenses available to PGIM Limited including those available under temporary permission arrangements following the exit of the United Kingdom from the European Union. These materials are issued by PGIM Limited and/or PGIM Netherlands B.V. to persons who are professional clients as defined under the rules of the FCA and/or to persons who are professional clients as defined in the relevant local implementation of Directive 2014/65/EU (MiFID II). In **Switzerland**, information is issued by PGIM Limited, London, through its Representative Office in Zurich with registered office: Kappelergasse 14, CH-8001 Zurich, Switzerland. PGIM Limited, London, Representative Office in Zurich is authorised and regulated by the Swiss Financial Market Supervisory Authority FINMA and these materials are issued to persons who are professional or institutional clients within the meaning of Art.4 para 3 and 4 FinSA in Switzerland. In certain countries in **Asia-Pacific**, information is presented by PGIM (Singapore) Pte. Ltd., a regulated entity with the Monetary Authority of Singapore under a Capital Markets Services License to

conduct fund management and an exempt financial adviser. In **Japan**, information is presented by PGIM Japan Co. Ltd., registered investment adviser with the Japanese Financial Services Agency. In **South Korea**, information is presented by PGIM, Inc., which is licensed to provide discretionary investment management services directly to South Korean investors. In **Hong Kong**, information is provided by PGIM (Hong Kong) Limited, a regulated entity with the Securities & Futures Commission in Hong Kong to professional investors as defined in Section 1 of Part 1 of Schedule 1 of the Securities and Futures Ordinance (Cap.571). In **Australia**, this information is presented by PGIM (Australia) Pty Ltd (“PGIM Australia”) for the general information of its “wholesale” customers (as defined in the Corporations Act 2001). PGIM Australia is a representative of PGIM Limited, which is exempt from the requirement to hold an Australian Financial Services License under the Australian Corporations Act 2001 in respect of financial services. PGIM Limited is exempt by virtue of its regulation by the FCA (Reg: 193418) under the laws of the United Kingdom and the application of ASIC Class Order 03/1099. The laws of the United Kingdom differ from Australian laws. In **Canada**, pursuant to the international adviser registration exemption in National Instrument 31-103, PGIM, Inc. is informing you that: (1) PGIM, Inc. is not registered in Canada and is advising you in reliance upon an exemption from the adviser registration requirement under National Instrument 31-103; (2) PGIM, Inc.’s jurisdiction of residence is New Jersey, U.S.A.; (3) there may be difficulty enforcing legal rights against PGIM, Inc. because it is resident outside of Canada and all or substantially all of its assets may be situated outside of Canada; and (4) the name and address of the agent for service of process of PGIM, Inc. in the applicable Provinces of Canada are as follows: in **Québec**: Borden Ladner Gervais LLP, 1000 de La Gauchetière Street West, Suite 900 Montréal, QC H3B 5H4; in **British Columbia**: Borden Ladner Gervais LLP, 1200 Waterfront Centre, 200 Burrard Street, Vancouver, BC V7X 1T2; in **Ontario**: Borden Ladner Gervais LLP, 22 Adelaide Street West, Suite 3400, Toronto, ON M5H 4E3; in **Nova Scotia**: Cox & Palmer, Q.C., 1100 Purdy’s Wharf Tower One, 1959 Upper Water Street, P.O. Box 2380 - Stn Central RPO, Halifax, NS B3J 3E5; in **Alberta**: Borden Ladner Gervais LLP, 530 Third Avenue S.W., Calgary, AB T2P R3.

© 2024 PFI and its related entities.