

'Theory Meet Practice' with Marcin Kacperczyk

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Hello everyone and welcome to Theory Meet Practice, our video series about academic research into sustainable finance and the lessons that investors can take from it. If you follow climate finance, you know that investors have expressed concern over the risk that global warming poses to every asset class. Marcin Kacperczyk, a professor of finance at Imperial College London, who together with co-author Patrick Bolton, has showed that climate transition risk to companies and investors will increase so long as global carbon emissions continue to rise.

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Marchin has a habit of illuminating the implications of climate transition for investors. We know thanks to Marcin's research that corporate climate commitments have had little aggregate impact on reducing emissions, and that more than half of companies globally have pledged to cut their carbon emissions are missing their targets. So what, if anything, can investors do about this? Marcin Kacperczyk received his doctorate in finance at the University of Michigan and has a master's degree in finance and banking from the Warsaw School of Economics.

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It's my pleasure to be in conversation with Professor Kacperczyk today. Welcome, Marcin. Thank you very much, Rumi. So Marcin, for the benefit of our audience, I'd like to start by asking you to define climate risk, which has been the focus of your most recent research. Yes, Rumi. So in finance, when we talk about climate risk, typically we have in mind two types of risks. One is related to the...

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physical risk associated to climate itself. So you can think of it as risk related to damages, any kind of physical effects associated with the atmosphere. And then there is another type of risk that people call transition risk. And when we talk about transition risk, that's oftentimes actually independent of the physical risk. This is more related to the idea of what we as a society want to do about climate risk, meaning physical changes.

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And we know from science that one of the solutions is to reduce emissions. And essentially transition risk, which is the second type of risk, is associated with this process of removing emissions from where we are right now, which is quite a lot of emissions, towards zero, which is what scientists recommended to us if we actually want to contain the temperature increase within some reasonable bounds. And you and your co-author, Professor Patrick Bolton, you speak of a significant carbon

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investors increasingly expect to be compensated for investing in companies with higher carbon emissions. I'm wondering if you can actually quantify the carbon premium and perhaps explain for viewers how climate transition risk is proportional to a company's level of carbon emissions.

Absolutely. So the first thing I want to mention in the context of the previous question, when we are talking about emissions and the carbon premium,

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Essentially, in pretty much 100%, we are talking about transition risk. So this is the type of risk that we want to see being priced or not priced in assets. And then, of course, the question is, how do you measure that? And in our work that we have done with Patrick, we have thought of it as being related to emissions. And largely, it's based on what we think of transition risk to be, which is essentially this idea of going towards zero.

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So if you think that every company at some point in time has to go towards zero, you can kind of to the first order approximation argue that the distance of how far you are from zero tells you the scope of your problems in terms of how much actually you need to get rid of in order to be compliant with the social expectation. So then kind of using that logic, we argued that the higher emissions of companies are going to be more meaningful of the larger risk.

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relative to the company's smaller emissions that would mean that you are closer to that bound and the risk is smaller. This is just one way of thinking about transition risk and it's a very crude one, but of course the benefit of using a measure like this is that it's also very easy to construct. So in this regard, in the way how the profession has proceeded, including the practitioners and the academics, we strive to measure emissions more and more accurately and much more comprehensively.

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This is where this data becomes very useful because we can apply it at the frame by frame level. And then the question about the magnitudes, how large the transition risk is and how large the carbon premium is. It's important to recognize that in most of the research that we academically do, we are thinking about cross-sectional premium. So essentially the fourth experiment is, let's take two companies that otherwise are very similar.

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you can think of them in terms of size, types of industry, types of growth prospects, etc. And let's move them from each other in terms of the level of emissions by some metric. The question is, what would be the difference in terms of cost of capital of companies with these different emissions holding everything else the same? And in this kind of exercise that we have done in our work,

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We found that if you move companies by roughly one standard deviation of the distribution of emissions, that premium is on the order of 2 to 3% per year, depending on which sample you take, depending on what time period you take. That's essentially what I have in mind. So let's

talk a little bit about some of the more specific aspects of transition risk in your findings and perhaps let's start with shifts in technology.

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You note that a country's energy production mix is an important predictor of how investors price risk with respect to short-term changes in emissions. Now if I'm an asset owner, how might I want to think about that and should I be advocating a tightening of policy, for example? This is a great point and this is now going a little bit more into detail and the mechanisms, which I think is very interesting that you've asked this, because of course transition risk can arise from many factors.

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and one of them being technology. So essentially what we have in mind here is that in this process of going towards zero, we need to actually have tools by which we are gonna do it or we are gonna achieve that. And technology is of course this magic fairy that is oftentimes brought up, that this is what we need to actually transition. And now, of course, depending on what the state of these technologies is going to be, we are going to be facing more or less costs in this transition period.

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So now you can imagine that some companies that already have access to fairly cheap green technologies, they are going to face lower costs relative to companies where, for example, they still rely on the traditional kind of fossil fuels technologies, etc. And that's where I think this distinction between short-term and long-term becomes very interesting, because if you think about technologies, paradoxically, we really don't know much about long-term. We know a lot about short-term.

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And in this regard, it's useful, for example, to recognize that, for example, solar or wind or any other kind of green energy production works. But if you think about where we are going to be 20, 30 years into the future, I hope you would agree and I would definitely believe that there is a lot of uncertainty. So investors are kind of attaching the value premium based on the short-term horizon relative to this technology, but not so much on the long horizon because there is just too much unknown.

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in the way how you want to think about this technological progress. And now coming back to your last point about what it is that you can do. Of course, in the short run, what you could do is you could promote this kind of technologies that work. That's the way of reducing that transition. So governments oftentimes introduce policies that, for example, subsidize a particular technology. A very famous case is the case of Tesla that some countries actually subsidized the...

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consumption of electric vehicles. Norway was this very prominent example. So this is the way how you may think about where policy becomes kind of useful in the process of integrating technology into this particular aspect. But I just want to maybe add one thing that I found very surprising from another work I've done with Patrick and a student of ours, Moritz Wiedemann. And what we found was actually something potentially interesting with respect to your question on the long run. We look at the

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distribution of patenting activity in the green space. And we asked the question, do patents, which admittedly are not about short term, but about more long term, because it takes time to develop them, predict the decarbonization of companies? And the short answer is kind of unfortunately not so much. So if we think about where we are gonna be 10, 15, 20 years ago, I dare to think that we don't really have yet a solution there.

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So if we want to actually engage in this decarbonization forces in a meaningful way, I think our best hope is what works now, rather than hoping that there is something that potentially is going to rescue us in the future. So that's how I see this playing out in the next 10, 15 years. Your research also found little meaningful difference for transition risk between companies in green and brown sectors. How would you say this translates for investors who they're being advised by various transition frameworks?

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to go where the emissions are and focus both investment and engagement efforts on that handful of so-called brown firms. But also on the flip side, there are investors, particularly in Europe, who are also being asked to decarbonize their portfolios, which in effect means allocating more sectors such as IT and financials, which of course doesn't translate to real-world decarbonization. To be honest with you, when I started doing empirical research on climate finance several years ago...

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This was one of these kind of data features that I was quite surprised about. Because coming to the data before, my view was a little bit like your prior. In a sense, this is going to be about a few industries and this is what we need to kind of control. So two things kind of came very interesting out of this first kind of glance of the data. One was that emissions are not just the problem of a few industries.

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Of course, it's true that certain industries have higher emissions than others. I'm not going to try to convince you otherwise, but it's not true that we are just talking about two or three industries that we need to regulate and the problem is going to be solved. And especially not true if you want to go deeper beyond direct emissions into indirect emissions. Like even the IT sector that you mentioned, of course, directly doesn't contribute to production of emissions, but indirectly very much so through the consumption of energy,

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and also all the products that need to be produced in order for the IT to function. But the second one, and I think this is maybe more directly related to this comment you made, is the story if we look at a given industry and we try to measure what's the across-perm dispersion of emissions within an industry, you find that that dispersion is still actually quite large. So in other words, you cannot just apply this kind of one-size-fits-all framework.

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Typically we think, okay, you are an oil and gas company, you must be bad, period. That's not true. If you look at that industry, there is a lot of variation in terms of emissions. And in this regard, this is what I say, that what matters is not so much which industry you belong to, but what's your individual contribution to the emission, even conditional on being in that industry that you look at. And I think it's very important to actually take that into consideration.

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The carbon premium varies significantly based on what you term investor awareness, about carbon risk citing a big change in Asia after COP26. Can you elaborate and perhaps suggest what a global investor can learn from that? Now we are talking about the very players who are actually in the business of pricing assets, and these are the investors. So now what we learn is that actually the awareness of this climate has become bigger over time.

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Here clearly the COP21 was a very big milestone, mostly because we established this commitment framework for individual countries that many companies subsequently also tried to adopt. And now of course what we learn is that more and more investors are kind of following on that. I mean, you know it very well, there are a lot of different alliances on net zero, both investors, banks, but also other players.

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And the more of this kind of framework is being put in place, you may think that there is more expectation on the side of the stakeholders to do something about it. And I think we see it in the data that if you look at the kind of time series value of this carbon premium, that premium actually becomes larger and larger over time. And interestingly,

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it seems to be actually also correlated across different regions and countries. So it's not just that that is just uniform for every country, but it also correlates with other aspects of countries. So, for example, Europe, Asia typically are stronger kind of effects than North America, which politically, I think, is sometimes well understood. And sticking with the tobacco analogy, in the US in 1998,

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State Attorney General and the Big Four tobacco companies agreed to a settlement to recover billions of dollars in healthcare related costs with treating smoking related illnesses. Could you

ever envision a similar settlement with the biggest carbon polluters, the more that climate related loss and damage intensifies? I think so. I actually liked it a lot. So I've written a paper many years ago called Price of Sin where I look at the tobacco industry you mentioned.

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And there it was actually something quite stunning. Around 1960s, when the medical doctors started issuing negative reports about the tobacco industry, you observed a massive shift in the valuations of these companies. They basically turned from something that we tend to call growth company into something we call a value company, meaning their valuations got very depressed right at the onset of that shift. And then subsequently, we observed that these companies and very high actually.

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returns going forward. And I think something similar could be actually attributed to what we observe right now in the climate space. Of course, depending on whether you look at green versus brown companies, this could be going in the opposite direction. But I think what we need to recognize is that there has to be a shift. There has to be a shift by which investors are going to change the way how they price assets with a particular expectation for the future. So just to give you an example, around the COVID time,

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we've observed massive increase in the green companies' values. There was a whole discussion that Tesla's, etc. the companies are doing extremely well and the oil companies were doing extremely poorly. And then I remember at that time we used to be kind of provoked with Patrick that your results are saying exactly the opposite because you say your returns are higher for brown companies versus green. But we used to explain at that time that there is nothing actually contradictory here.

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Because expected returns are about the future, so for them to be accrued, there has to be repricing. So in other words, if Tesla is expensive now, that tells us that going forward probably expected returns are gonna be lower and vice versa. If oil companies are going lower, maybe there is an expectation that going forward the expected returns are higher. And that of course we attribute it to the differences in the risk. So the only difference I wanna say about that

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comparison to tobacco that makes it much more difficult and that's where we found it difficult to provide the kind of so to say smoking gun argument is that this notion of climate is a much more heterogeneous beast than just one industry such as tobacco. So in the context of tobacco it was very easy to pencil down what it is really that has happened to that industry and what are the timings kind of we should be looking at in terms of understanding the implications for prices.

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When you look at something like the whole economy that is exposed to climate, it's much harder to stage this transition in such a way that I can show you in a convincing way that there is this kind of repricing going on. So I think our best hope is to look at the industry by industry basis and try to see whether these things are reflected in that. But I don't think we can just measure it in a very easy way on an aggregate basis. But I do think that...

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this kind of paradigm has to happen in a very similar way how we have observed it for tobacco. Also, given your findings, I'm wondering what if any value there may be for investors in paying attention to corporate climate targets. And it doesn't make sense for investors, for example, to pay attention to whether a company has a science-based climate target or not? So this was actually something that initially we didn't expect to find. So we look at this aggregate data and we saw there is a quite a steep increase in commitments.

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Yet if you kind of cross it against the level of aggregate emissions, we found that emissions were not going down at the same time. So that kind of struck us, how is that possible? And then the kind of simple resolution that we found to this conundrum was that the companies that actually make commitments are not necessarily companies that are the biggest problem to deal with. So these were largely companies which had smaller emissions. They were the leaders in their own respective industries rather than the laggards.

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So in this regard, if the laggards are actually producing more emissions, the increase in these commitments is not necessarily going to help you unless you involve these other companies there. But I want to caution that statement that it is actually factually correct that our study was based on what we call the early stage of commitment. So in this regard, it could be that we are now transforming into something more serious and I think what we want is something very similar to what I mentioned earlier.

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some kind of accountability for what actually companies are delivering in terms of what they commit. Because I think the number of commitments is definitely still going up. I think what we need is a framework that kind of ensures that there is some kind of reward and penalty for making or breaking the commitment. And this is actually a project that I've also been concurrently working on. So maybe just to give you one interesting fact, we found that roughly one third of companies are actually not making their commitments. So...

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It's a pretty large number. And at the same time, if you look at the implication of that fact for something like valuation of companies, it doesn't seem to be very large. So that doesn't seem to be a transmission mechanism that says that if you fail your commitment, there is some kind of penalty that is going to be assigned to you as an investor. So, so maybe this is going to change.

I would like it to see, because of course, this is kind of the incentive mechanism you want to observe.

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But at least based on the exposed data, that has not yet materialized. So I think that's probably what is consistent with your story of the tracker. And you mentioned regulators and the role of policy. Do companies domiciled in a country that tightens their climate commitments tend to adjust their commitments accordingly? Or would you say there's no relationship between sovereign commitments and corporate commitments?

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I think that's a great question and this is actually something I'm actively now working on. I don't have yet results. The basic results from the work we've done with Patrick was that there is some relationship between the country commitments and the firm commitments. But I think ideally what we would like to observe is that this kind of meaningful commitments on the country are kind of trickling down into the firm level. And what's challenging about that is that right now we don't have a legal framework.

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that actually mandates the companies to actually follow through on this country-level commitment. So unless we have that to be legally binding, it's very hard to see how one is going to translate into the other one. And of course, what does it mean the country commits? Essentially, what we are thinking about is some kind of realization on that, on the decentralized basis of individual companies. So I hope, and I think that's probably what I would expect, that the more of the pressure

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the more actually there would be a pressure of an individual country on the kind of downstream of the economy, which is individual companies. So speaking to your question, that suggests that if you relocate to a country which actually has deeper kind of decarbonization targets, you may expect that the company is also going to have to follow through on the same kind of decarbonization paths. So I'd like to wrap up with a question that we've asked all of our guests so far, Marcin.

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If you were stranded on a desert island and you could only have one academic paper with you on sustainable finance, other than one of your own, and you weren't planning on using it to start a fire, of course, what paper would you keep with you that you'd read over and over again? Yeah, no, that's a tough one, to be honest with you, because there are, of course, many interesting research studies. I like my own papers, of course, but I get bored occasionally with my own work as well.

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I think the one piece of work that I got inspired by quite a bit is the work by late Marty Weitzman. So he told us quite a lot about the physical kind of translation of climate into economics. So I think this has been the kind of motivation and inspiration for a lot of research I have done myself, so just at the broad level. So I would always like to remind myself that this is something that actually is behind this whole movement that we observe.

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that brings me back to these foundations. And these studies are, to me, good examples of the kind of foundational work to think about empirical context of climate finance. Thank you so much for your time and great insights. This has been great. I really appreciate your time and sharing your insights. And I look forward to reading more of your research in the future. Thank you very much, Rumi. And thank you for the opportunity.