Jennison Associates
Modeling Mastery
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[00:00:00] **Alex:** Alright, Dmitri Rabin, welcome back once again to clipping coupons with Jennison fixed income.

Dmitri: Great to talk to you, Alex.

Alex: Perfect. So you and I have talked a couple of times now. most recently we talked about mortgages, And this, this is gonna be kind of a follow up episode in a more detailed way, a little bit about how professionals think about the market, how models work, then, yeah, we're going to go into a little bit of numbers here and get your opinions on how to actually interpret the numbers and work with them. How's that sound?

[00:00:31] **Dmitri:** That sounds great. And I should tell our listeners, since Alex is so modest, Alex is actually one of our quantitative experts, so he's sort of a triple threat.

So he and I can get pretty technical about how to think about mortgages. But we're actually gonna use this time to both talk about. How people use models and where models get silly and you can actually do a better job just using common sense. So I'm excited to have that conversation that's both deep and at the same time, quite broad.

[00:01:00] **Alex:** Perfect. Looking forward to it, Dmitri. Okay. Alright. So first one here. Um, I like to think of us as professionals here -- you are certainly a professional having done this for decades. How would you describe the way that professional investors think about the mortgage market?

[00:01:17] **Dmitri:** Yeah, so the way the institutional investors think about the agency mortgage market is they start by saying, look, this is guaranteed by either explicitly or implicitly by the US government. And the big risk I need to think about is the risk of prepayment or extension, and the best way to think about that risk to start with.

Is, think about the initial rate of the borrower. The reason for that, just to review very briefly, is if you have a 30-year mortgage and you have a 6% rate on that 30-year mortgage, if today mortgage rates are 7%, you are pretty unlikely to refinance. If on that hand today mortgage rates are 5%, you're more likely to refinance because you could prepay that mortgage, get a new one at 5%, and get a lower interest rate.

Investors in the mortgage market take that risk that the borrower will is, becomes more or less likely to refinance. Mm-hmm. And they're paid is spread over treasuries, um, to buy that product. So the first way that we group the market is through to what we call a coupon

stack. Uh, and what that is, is you basically take the rate of the borrower, subtract some fees from it, and end up with rates which function in a 50 basis point ladder.

Mm-hmm. So you can have a 5% mortgage. You can have 5.5% and the market is sort of grouped and trades that way today because we've been through a period of extreme rate volatility. Our coupon stack is extraordinarily wide and gives us really a lot of options as investors, which, um, for institutional investors is kind of exciting.

But you can start with one point a half percent mortgages, right? Those are gonna be very low coupon. As a result, they're also gonna be at a very large discount.

[00:02:53] **Alex:** So those are, those are mortgages that were issued at around two and a half percent. Yeah. And then, uh, the investors, if you [00:03:00] buy those mortgage backed securities, you get around one point half percent coupon coming off of those. Is that right?

[00:03:03] **Dmitri:** You get exactly one and a half percent coupon because the government is sort or the fan, Freddy Ginny guarantee you that fixed rate coupon for the life of it. And then you get principle as the borrowers in that pool pay off. Perfect. And on the flip side of it, you today have seven and even seven point a half percent, um, coupons.

So the stack goes from one point a half all the way to seven or seven point a half, and the 7% of borrowers who took out a mortgage at close to 8% given the rates have recently been quite high. Um, and those have a very, very different profile. Those are gonna trade at a premium, meaning that if a borrower prepays, you lose the premium.

Discount mortgages, right? One and a half straight into the low eighties. If the borrower prepays, you actually gain that discount, you get back Par.

[00:03:52] **Alex:** Mm-hmm.

[00:03:53] **Dmitri:** So those are sort of the pieces of the mortgage market, and we talk about it as the generic mortgage market, the specified market. Mm-hmm. The generic mortgage market is what's called to be announced or TBA market, and you could think of that as sort of kind of the worst to deliver sort of type of a market.

Meaning that if a generic mortgage gets issued and it sort of doesn't have anything special about it, it's going to trade in that market. That market is actually quite large. It's very, very liquid. It's a derivative market, which also allows banks and other institutions that issue mortgages lend to people to basically forward sell their production.

So when they. Make a mortgage if you take out a mortgage, and I happen to know that Alex, recently, congratulations closed on a place. When you take out a mortgage, you usually say, look, I'd like to lock in this rate for 60 or 90 days. When you do that, the financial institution who you take the mortgage actually sells that into the TBA market 60 or 90 days into, into the future so that they basically are not taking that additional risk.

They know where they're able to finance that mortgage that, um. That you're taking. So the TBA market is a great market. It's very deep. It allows us to quickly reposition across the coupon stack. You then also have the specified pool market. Now you're grouping things by characteristics and paying some premium or discount, usually premium versus the TBA market for loans, which for whatever reason have a better prepayment characteristics.

So they might be. Investor borrowers who have to pay a higher rate and therefore cannot prepay quite as easily. Right. As an example. There's, there's all of these different characteristics that have been built up over time, and this market gets very, very detailed and very, very complex quickly.

[00:05:50] **Alex:** Perfect. Okay.

So as you've kind of touched on so far, there's a lot of numbers around mortgages changing all the time, whether it's the coupon or the [00:06:00] amount of mortgages issued or the amount of prepayments plenty of news headlines about those numbers or news headlines about where those numbers might be going or news headlines about what governments are doing. How do professional investors start to make sense of all those numbers and news headlines floating around?

[00:06:19] **Dmitri:** Yeah, so this is a market. That for institutional investors is very model driven. And people, when mortgage investors get together, they often say, oh, which model do you use? Kind of, you start with that discussion.

What I mean by that is you need to quantify across different mortgages which have different prepayment characteristics and potentially different coupons. So they be, they serve, their volatility differs. Um, you need to quantify that and what models allow you to do, they'll run. What's really known as a large Monte Carlo, but they'll run sort of a large number of interest rate paths into the future and say, assuming a certain sort of volatility of interest rates or interest rates up a little bit, interest rates down a little bit shocking in various ways.

How do these mortgages compare? So we end up talking about an option adjusted spread in mortgages quite a lot. So the first part of it is people; people use a lot of models and models allow you at least locally to compare, what you're doing now. Models are only as good as sort of your inputs and they can be useful without always being right.

[00:07:27] **Alex:** can you talk about that for one second before we move on? How does, how does being useful instead of being right,

[00:07:33] **Dmitri:** how does that match up? Yeah. So. For, for example, models will not tell you right precisely where interest rates might be or what the future holds, but they will tell you that if interest rates move in a particular way, what is likely to happen to one pool of mortgages versus another pool of mortgages in terms of prepayments, in terms of its price and in terms of returns that you get as an investor.

And they also allow you to quantify your uncertainty, right? So models. Allow you rather to say, well, this is probably what will happen. It will tell you, well, I think around this, I have a different confidence. I'm pretty certain that this will happen. This other thing is really, really uncertain because this is a characteristic of the model that we haven't seen before.

I'll give a little bit of an example if that's helpful. When 2022 came, mortgage rates shot up very, very sharply. We started with two and a half more percent mortgage rates. Before we knew that we were at 6.5%. And so all of a sudden, the entire universe of mortgages that has been created was at a significant discount.

They were at a $80 price, sometimes a $75 price, and the question was, well, how will they prepay? And people looked around and said, if you are honest, like models can make some assumptions. But the uncertainty was very high because no one had really seen how mortgages, which were 4% below where the newly [00:09:00] offered mortgage rate was, how those were gonna perform.

And so. I can go back in this market to the early two thousands, but I was able to talk to some folks who went back much further and the models do have some data from the nineties when you had sort of a significant rate increase and you, you sort of started to figure out, well, we think that they will have this sort of prepayment rate.

And if you can think about it, if you're buying a mortgage at a $75 price, whether it prepays at 4% a year or 5% per year. Is actually really, really meaningful because you're getting 25% right? Yeah. per prepayments sort of premium every time one of those prepays right? You, you get trued up to par. So that's an example of a model that was very useful, but you had to be, your uncertainty was quite large and you sort of, as you got a little bit of data, this is where active management becomes pretty interesting.

You could say, okay, we now have a little bit of data, just a few months. Well, I can adjust my wagers a little bit in terms of what I own, based on what I learn. And as you learn more, you adjust more. You sort of try to be one step ahead of, uh, the information that you gather, but models are quite useful that way.

[00:10:07] **Alex:** Thank you. Sorry, that was my little side tangent question of the day. And then how do the models actually work? How, how do you sense check them from what you see in the math versus what you see in reality?

[00:10:22] **Dmitri:** Yeah. So the first thing, that we do, is we compare mild predictions with actual prepayment, for different parts of the mortgage market.

So this is the traditional quantitative work you say, you know, last month we predicted that a particular type of mortgage in a particular coupon was gonna prepare a 20%. Did it actually prepare 20, 22, 18? Right. And other errors seem to be biased in a particular direction. That's, that's a pretty typical way that you do the first part of the mortgage market, right?

And once you do that, you can refine your models, right? And say, well, I'm going to make a change to the model in a particular way. I'm maybe gonna use a different model or trust a different model more for a particular type of security. Or you could just as an investor sort of. Buy more of the things where you think the model is being too pe, pessimistic or conservative, and less of the stuff where you think the model is being too optimistic and overstating the spread.

And we do, we do some of both as we, uh, as we look at different things in the mortgage market. The second activity is to take a step back, um, from the details of the MBS market and decide whether the market assumptions are right, right. That's a really fun part of the job. So the first part is you understand kind of the basic mechanics.

The second part is you start building, maintaining, refining these models and tuning them. The third part is once you've mastered that is just take a step back and say, well, like what is the world at large telling us? Now, let me give you an example of what I mean and why I think this is very important right now.[00:12:00]

Okay. Um, the agency mortgage market. Is the number one largest source of leverage of borrowing for the US housing market, which is itself a $30 trillion asset class that's absolutely critical to the health of the US consumer. As a result, it is a politically sensitive, extremely politically sensitive and important data point, maybe second only to the price of gasoline.

People think about. The mortgage rate quite a lot because it impacts whether or not a young family is able to go out there and afford to buy a home, or if somebody is able to sell their existing home and move into a larger home because now their family has gotten bigger or somebody wants to move to a different location, right?

In all of those cases, you're gonna need to get a new mortgage potentially, and the price of that is really, really important. The way that we work as we. As the securitized team, the corporate credit team, and the rates team together, we, we literally sit together. We talk all the time, and that gives us some flexibility and also the ability to take a step back and think about it.

So if I think about it a little bit from the perspective of some of these models, interest rates today, if we, if we look right now, and I'm going to give sort of some rough numbers. The two year treasury rate is around 3.6, 3.7%. 10 years around 4.2%, the 30 year, 4.8%. Now, what that tells you is the rates Mark is telling you the rates in the future, at least in the most likely case, are gonna be higher than they are today, right?

Let's say, versus the two year. And that also means that when you build all of these models together and you run the forward mortgage rate, right, what would you predict the mortgage rate to be? You take kind of where you think interest rates will be overall. You add on the additional costs of creating owning right.

Mortgage servicing mortgage. Yeah. There, there, there's a budget of costs on top of it. The mortgage rate today is around 6.8%.

[00:14:09] **Alex:** Mm-hmm.

[00:14:09] **Dmitri:** Right. So you could think about it as so versus the 10 years, a common way to think about a 10 year at 4.2 you're at 6.8. Um, that is a generational high. And when we take a step back, we say.

Wow. The models that we have today will tell you that over the next 10 years, if interest rates are about right and their interest rates also operate with a degree of uncertainty. But the kind of the base case, the forward rate, what we call mortgage rate in the next 10 years will never be below 6%. In fact, it's never gonna be below six in a quarter.

Now I can take a step back and say, hold on.

Alex: How do you, how do you know that?

Dmitri: the way that, the way that the models would derive that.

Alex: [00:15:00] So it's not, not anything you've mentioned so far that's just from a different way

Dmitri: the models would derive that. It's a great question. So the way you know what the forward mortgage rate would be, right, is you would derive it in these models.

Alex: Got it.

Dmitri: So you would start by saying, the future interest rates look like this, which sort of gives you a clue as to where interest rates at different point will be in the future, because. You have a 30 year mortgage. So that's sort of where the 28 year mortgage will be in two years, sort of that sort of a thing.

And then you overlay on that a certain additional spread.

[00:15:29] **Alex:** mm-hmm.

[00:15:30] **Dmitri:** For owning mortgage debt instead of treasury debt. Understand. And that's going to give you sort of your long-term rate. Now, I think if somebody decided to run for office today on the promise mortgage rates will not be. below 6% for the next 10 years, I think it would be a very unpopular platform.

Yeah. And so part of what we do is think about, well, what is this? What is the policy angle around this? And the policy angle is there's an enormous pressure to bring that rate down

regardless of what the markets are saying today. Mm-hmm. And how would you do that? Well. Um, you might be able to do that by bringing down the short end.

Did we see a lot of pressure on the Federal Reserve to do that? A lot of that has to do with the mortgage rate. Secretary of Treasury, Scott Bessent, has repeatedly mentioned the mortgage rate is sort of the most important rate that they think about,

[00:16:29] **Alex:** Which would involve not only lowering the rate short term, but keeping it low for extended period of time. Is that right?

[00:16:34] **Dmitri:** Promising to keep it long for an extended period of time, and that makes longer rates more attractive. So potentially those come down. As long as you don't have runaway inflation, which, so there's all, all sorts of complexity there. Um, and then you can also think about, uh, bringing down that spread between the mortgage rate and the treasury rate.

Mm-hmm. And there's some ways to do that. The bluntest is for the US Federal Reserve to buy more agency mortgages, which they've done in prior periods. The more sophisticated might be to make it possible for Fannie and Freddie. And here I'm gonna make a little bit of a prediction. To buy their own paper and become again, something that they used to do in the good, bad old days before 2008.

So if we go to ancient history, right, and what that does is if they're always coming into the market when spreads are wide

[00:17:25] **Alex:** mm-hmm.

[00:17:26] **Dmitri:** And they have a government guarantee behind them, that basically brings down the future volatility of spreads. Because now you have a buyer who is programmatically coming into the market with an.

Almost infinite balance sheet from the federal government to bring down few sort volatility of spreads. Those are some of the things that are possible. I'm sure there's other things that us Treasury and sort of the folks in the administration are thinking about, but when I look at the model and I think about, well, where's the potential blind spot?

What is something to think about [00:18:00] today? The big one for me is this idea of being able to pull out of the model certain key variables and say. A mortgage rate that stays above 6% for the next 10 years, how politically palatable does that sound? And if not, what are some things that might happen? And then you can model that.

You can bring in a lower mortgage rate, you can tighten that spread. All of that is going to increase prepayment risk in the mortgage market. So your premium coupons, going back to what we actually do, are going to be riskier in an environment where. The model thinks that

your mortgage rate's going to be 6.5%, 7%, but in fact, the treasury secretary thinks that you should be 5.

The treasury secretary turns out to have some levers to get it there. All of a sudden your premium coupons become quite risky.

[00:18:49] **Alex:** Because of the, because of the ability to prepay at that point?

[00:18:54] **Dmitri:** Yes, because at that point they become very, very prepayable.

[00:18:58] **Alex:** Understood. And then from a functionality standpoint, do you expect privatization to change anything? Do you expect mortgages to be easier or more challenging to get maybe different cost level for the consumer if they're trying to refinance or open up a new mortgage? Or just things generally stay the same?

[00:19:19] **Dmitri:** So we know what the administration wants, which is they want to privatize Fannie and Freddie, and they also want mortgage rates to come down.

Now those two things are potentially in conflict. They don't have to be, but they're potentially in conflict. If you privatize Fannie and Freddie and you don't provide a government guarantee, then potentially the spread on Fannie and Freddie mortgages goes off. Because consumers have to worry about, well will the US government, these are now private entities, really be there.

Okay. If you provide a completely explicit guarantee and you say, no, these are now explicitly guaranteed by the US government, then do you actually have to count 'em as part of US government debt? And that changes a lot of things sort of politically in terms of the ratings of the US government debt and so on.

Because that's another sort of $6 trillion or so of debt that is sort of financed through these entities where the US government provides a guarantee, but it's not held on balance sheet. So I think they're, they have a tricky job to do to thread the needle correctly. I think it's possible that they do it.

I do think that they're likely to be such some speed bumps as they figure this out, because where they want to end up is private Fannie and Freddie with larger balance sheets. More active in the markets, again, be like before '08, but at the same time with investors feeling confident that these things are guaranteed by the US government and the US government not explicitly saying that they're guaranteed.

[00:20:55] **Alex:** Mm-hmm.

[00:20:56] **Dmitri:** That's, that's sort of a little bit of a dance. Can it [00:21:00] be done? Absolutely. Do we think there's likely to be some headline risk and some risks as we go through that process? Yeah, we do. And. We're sort of positioned accordingly.

[00:21:10] **Alex:** Okay, Dmitri, thank you so much.

Anything else you want to say to the people before we stop recording here?

Dmitri: No, I think this is great, Alex, thank you for taking the time today.

Alex: No, thank you again. Appreciate it.

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