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EP28 | Defining intrinsic value in a stochastic world

00:23	**Cameron Webster**	On this episode, we tackle one of the three tenets of our investment philosophy: investing at a discount to intrinsic value. Justin Anderson, equity analyst, and leader of the lab here at Mawer, walks us through the definition of intrinsic value, how we model it, and some of the ways it might be influenced by technology now and in the future.
01:03	**Cameron Webster**	All right! ... You are part of the lab, I want to call you a "valuation lab rat."
01:18	**Justin Anderson**	I'll take that as a compliment.
01:19	**Cameron Webster**	Okay, good. So, we'll start there. ... Justin, you've been doing some modelling, trying to automate all sorts of data stuff...and it all leads back to Mawer's approach on defining intrinsic value. The reason we got on this subject, (in terms of wanting to record a podcast on it), is maybe the opinion that, "intrinsic value"—as defined in the finance world—gets used a lot, and not a lot of people stop to define it.
02:06	**Cameron Webster**	I have in front of me a paper copy of a dictionary. Oh—no reaction from the crowd, that's okay. I'll prove it. Okay! [sound of pages ruffling].
02:18	**Justin Anderson**	[laughs] It's legit, people, he really does have one.
02:20	**Cameron Webster**	Yeah, I do. So, I'm going look up both words: intrinsic; value; and see where we get at on a definition. Intrinsic: "adjective: inherent, essential." There you go. And then value: "noun: worth, price, equivalent."
02:39	**Justin Anderson**	There you go.
02:40	**Cameron Webster**	So, "inherent price."

02:42 **Justin Anderson** Yeah.

02:45 **Cameron Webster** Justin, do you agree that it's an overused term? And, if it is, give us a definition.

02:52 **Justin Anderson** I think we can get kind of stuck into definition details. I think, when we talk about intrinsic value, all we're talking about is, “what is the value of a company in this case,” right?

The question of, “what is the value of something?” is an age-old question; it's a big question that people always ask. When you go into the supermarket, and you're buying carrots, you're asking yourself, “what is the value of this thing to me?” And then you're looking at the price of the carrots, and you're making a judgment call there of whether the value's worth it.

03:21 **Cameron Webster** Depends how much vitamin A's in it too.

03:23 **Justin Anderson** Well, that can affect the price; there's the attributes of the carrots, right? Economists have been struggling with this question of “what is something worth” for many years. David Ricardo, Karl Marx had this labour theory of value, and there's this subjective theory of value, so there're all these different ways that people have looked at this and said, “What is something worth?”

03:43 **Justin Anderson** We have an advantage because we're valuing, not something different from money—like carrots—where you have to make some kind of utility call of what it's worth, but we're valuing something that's producing money. We're valuing, in a sense, cash itself.

That's a lot easier because you don't have to make as many value judgments on whether or not this is something that I want for myself, or somebody else wants for themselves. We're valuing, when we talk about intrinsic value of a company, “what's the cash value of this thing?”

04:10 **Justin Anderson** The way to think about it, to make this very simple, is I can ask you a question, say, “if I give you $100 now, what's the value of that $100?” Well, it's $100—pretty obvious, right? That's simple. Well, then we can make it a little more complex and say, “what if I give this to you a year from now?” And then you say, “well, I'm not going to pay $100 for that, because I could

invest $90 and make 10% return on that and I'd have $100—so I'll probably pay you $90 for that."

04:33 **Justin Anderson** We call that the time value of money. That's one reason why the intrinsic value of companies—when we're looking at that—we have to discount (we call it "discounting") the future cash flows that we're expecting to get from the company. We have to bring it back to the present. And that's time value of money.

04:48 **Justin Anderson** There're other factors that go into it as well, in the future. It may be that I offer you $100, but you're not certain that I'm actually going pay you $100. Maybe I'm one of those friends that you lend money to and never pays you back [laughter]—I think we all have a couple of those. So, if that's the case—if it's the friend who's uncertain—then you might discount it even more. You might say, "you know what, I only think that's worth 50 bucks or less." And that brings in this idea of uncertainty in the future cash flows.

05:15 **Justin Anderson** When we're valuing a company, all we're doing is we're asking a very simple question: "what's this $100 worth under the fact that we're actually going to get that $100 sometime in the future, and there's uncertainty about how much of that's actually going to come back to us as equity owners?" That affects how much we take the $100 and bring it down to a different number. I would call that intrinsic value.

05:36 **Cameron Webster** So that's clear in terms of cash flows, but in order to produce cash flows, companies have assets. Nike has factories, those are assets on the balance sheet...certainly the assets and liabilities of a company factor into overall valuation.

Give us a sense of how that comes into discounting cash flows—how do we roll everything up? To me, "intrinsic" means everything the company's about.

06:04 **Justin Anderson** Yeah, you get into an interesting question around—if a company ceases to exist as a going concern, oftentimes what they'll do is they'll sell all the assets, they'll pay off all their loans, and then whatever's left will go to the shareholders. And that might be a very different value than the value if those assets are producing goods they're selling as a going concern type business.

06:26 **Justin Anderson** It's true that we definitely look at—we call it "the breakup value" of the company—where the balance sheet would be particularly important and would play a bigger role, because you'd want to see, "what does this factory make in the market?"

06:37 **Justin Anderson** But I think 99% of the time we're looking at going concern type of companies where we're projecting future cash flows and then bringing those cash flows back to the present. And the assets are very important because the assets are the ways that they generate those cash flows.

06:49 **Cameron Webster** Right. So, for growth purposes, a company would invest in more assets to create more cash flows.

06:57 **Justin Anderson** The debt is also very important because—you remember we opened with this example about uncertainty, your friend who doesn't pay you back—well, if you have a lot of debt, there's a higher probability that the company is that friend. [laughter] It might not pay you back as the equity holder, right? That's a reason why we also look at the debt side. And that's very important when we're trying to assess how much should we be willing to pay for that? Because if there is a lot of debt, and there is some risk that they might not pay it back...well then that brings it down significantly.

07:22 **Cameron Webster** Once we come up with an estimate, what do we compare that to?

07:26 **Justin Anderson** The obvious one to compare it to is the market price. The 101 version is just, "what's the intrinsic value of the company? And what's the market price telling us?" If we see a big difference there, then we might get interested in it—obviously—if [we think] the intrinsic value is worth more than the current market price.

07:44 **Cameron Webster** Okay, from there let's jump into tools, Justin. If you're valuing a company, what specific tools are we using? And then maybe we can get into a little bit about how we're improving them over time.

08:00 **Justin Anderson** Sure! We use a lot of tools. The core tool, I would say, is a discounted cash flow model, which is something where you do exactly what we've been talking about—you project cash flows based on the existing assets and

what you think the future's going to hold for the company, and then you discount those based on the risks involved. It's very much along the lines of what we've been talking about today.

08:19	**Cameron Webster**	Okay, so bare bones: you're sitting at your desk, you have a monitor, you have Excel open...
08:25	**Justin Anderson**	I always have Excel open [laughs].
08:27	**Cameron Webster**	Me too, I'm spreadsheet-dependent. I can't add numbers in my head anymore.
08:33	**Justin Anderson**	I've got a sickness, just too obsessed!
08:36	**Cameron Webster**	[laughs] I'm just trying to give listeners a sense of: yes, it's a Microsoft Excel model. But let's walk through some of the line items, actually, in a company's cash flow model that we estimate.
08:50	**Justin Anderson**	Top of mind: if you had to say one very important valuation metric, it would be return on capital. If we think about these companies as little cash flow machines; that we have to spend some money to buy this machine and then it spews cash over time—and we want it to spew more, obviously. The ability for that company, when it spews cash, to take that cash and put it back into the company so that it generates even more cash in the future—that's return on capital. The ability for the company to put money back in and generate even more than it did. So that number is really important; it's the foundation for what we look for in companies, especially at Mawer. I would say that's one important thing.
09:27	**Justin Anderson**	Another important factor is, if you do have this company that has this high return on capital—it's the kind of machine that we like, if you put money in you're going to get a lot more out—well, then you've got to look at the runway potential of the company. This is, how many times can the company actually do that process of injecting more money back into the company. If they already saturated their markets and they got nowhere to grow (this is growth)—well, then, it's not as interesting. You might have a very high return on capital, but you don't have the growth opportunity.

09:53 **Justin Anderson** An example of a company like that would be Apple. Apple has an extremely high return on capital. It invests and makes a whole bunch of money on its iPhones—very successful. But it's a very saturated market, and they already sort of dominate the market, so it's very difficult for Apple to be able to take advantage of that high return on capital in the future. So that means that, in the case of Apple, that might be less important.

10:16 **Justin Anderson** You might contrast that with a company like, say, Shopify, which we actually own in the Canadian Equity Fund. That's a company where the runway potential there is very significant. They're just starting at the beginning of the journey, let's say, and they've got the high return on capital, so that potential to deploy that is very high.

Return on capital is not always the same for every company ... you might have the same level of return on capital, but two different companies might benefit very differently from it.

10:39 **Cameron Webster** What other line items are we trying—

10:41 **Justin Anderson** Man, I gotta show you one of these models, Cam! [laughs] What else is there? You start with revenue—that's growing at some rate—and then you take that revenue, (you have costs in the business, right?) we call that "cogs"; and you break that down. And then you've got other costs like SG&A in the company, and eventually, you get down to your income that the company is generating. Then from the income you're paying some of that to dividends to your shareholders, some of it you're retaining back into the business and reinvesting. ... Basically the typical model is broken down like that.

11:14 **Cameron Webster** Do we forecast one single number? We're talking intrinsic value, so, for every company we own, or every company we run a model on—do we have one single number?

11:24 **Justin Anderson** Yes, at the end of the day it boils down to a single value of what the company is worth under that particular scenario.

11:31 **Cameron Webster** Okay, so listeners are probably waiting to hear what Shopify is worth. What's the single number, Justin? Tell us!

11:40	**Justin Anderson**	Ha! It's interesting because it's a good segue into how we think about doing our modelling at Mawer. ... We actually don't really like looking at a single scenario and saying, "that's the scenario." ... There isn't a single intrinsic value for Shopify. There is under a certain set of inputs. If I put a certain set of inputs I'll get a certain output.
12:00	**Justin Anderson**	But at Mawer, the way we look at our process is any given company doesn't have a single outcome that is the narrative that we're attached to. We actually see the world in a more stochastic term—very probabilistic. There's a range of potential scenarios that could turn out.
12:18	**Cameron Webster**	Right, so within doing that—that's the uncertainty.
12:22	**Justin Anderson**	That's part of the uncertainty. That's the uncertainty that we can try to project. There is a lot of uncertainty that we can't project, and that's part of the discount rate.
12:32	**Cameron Webster**	That's great, Justin! So if it's a range, how do you capture that in the model?
12:36	**Justin Anderson**	We use this well-known technique called the Monte Carlo simulation. In a Monte Carlo simulation—
12:40	**Cameron Webster**	Do you have to get on a plane, go to Monte Carlo, go by a casino?
12:44	**Justin Anderson**	It's like Google Earth, you don't have to get on a plane—you just run it, it works.
12:47	**Cameron Webster**	Cool.
12:47	**Justin Anderson**	You can think of it as a bunch of scenarios that you run—typically thousands of scenarios. You might say, "let's run this over 1,000 scenarios, and for each time we run an iteration of this Monte Carlo simulation, we're going to use slightly different inputs."
13:05	**Justin Anderson**	We're going to define the range of inputs. For each input, say, "this margin we expect could range from this to this; the growth could range from this to this," and then we feed that all into this Monte Carlo simulation and

what comes out is an output that's also a range that says, "the intrinsic value could be anywhere from $50 per share to $70 per share, based on the inputs that you've provided me." That's definitely how we look at valuation. We don't look at a single number, we look at a range of numbers.

13:30 **Cameron Webster** Okay. So we're getting into statistics land almost—in terms of using Monte Carlo analysis and running many scenarios. Do we use any set type of distribution? I'm digging into statistics here, but are we talking a normal distribution? Are we talking some kind of skew? What's our approach there?

13:51 **Justin Anderson** We use all of the types of distribution. An example would be—in oil and gas, we would use a lot more of a log-normal type distribution, which is indicative of the underlying nature of geology that goes into an oil and gas model.

If you're modelling the outcome of drilling a well, for example, then the outcome actually follows a log-normal distribution. And that's well - documented in nature — we see that. So for that case we won't actually say, "we think this well's going to produce X amount of barrels," it's actually going to produce a distribution of potential, and then we define that as log-normal.

14:22 **Justin Anderson** Many times we use triangle distributions, other times we use normal distributions...it just depends on what the nature of the input is, and we try to match that with reality as best we can.

14:32 **Cameron Webster** Wow, so there's a good degree of sophistication there that's underlying that monitor that's showing you the spreadsheets.

14:39 **Justin Anderson** Well, at least that's where we target. Doesn't mean we always get there.

14:53 **Cameron Webster** You touched upon discount rate ... and that's particularly important, I guess, if we're looking in the environment currently and there's signs of inflation, and rates are going up.

How do we capture cost to capital within our discounted cash flow model, and how often does that change? Give us a dynamic view of how we look at discount rates.

15:18 **Justin Anderson** First, to understand the concept fully, let's come back to that initial discussion that we had about the $100 in a year's time. That $100 in a year's time—it might be worth $90 today, it might be worth $50, it might be worth $30. Those different numbers are a function of how much risk there is to getting that money back at the end of the year.

The actual mathematic embodiment of that phenomenon is the discount rate. You would use a higher discount rate in the case that it comes back to, say, $30, and you'd use a lower discount rate in the case that it comes back to, say, $90. And then the question is: well, we know in our minds it's something to do with risk. So how do we actually get the number to define how much risk there is, and how much we should actually discount those cash flows by?

16:02 **Justin Anderson** That's a function of a few things. One important factor is the country in which the company is operating. Because the country in which the company is operating is going to have a different set of risks associated with it. We actually look at the yield curve for the country in question, and that yield curve is going to give us a benchmark of other investments that investors could actually put their money into.

So that's the starting point. You could go put your money in the yield curve, or you could buy this equity. That's your lowest-risk option. If these things were zero-risk, that would be your discount rate, the yield curve.

16:34 **Cameron Webster** So that's the friend that pays you back—

16:35 **Justin Anderson** That's the friend—exactly.

16:36 **Cameron Webster** —almost without asking.

16:38 **Justin Anderson** That's right, that's the sure friend, he's the yield curve. That's the competition. [laughter] And then you go down and you say, “what's next?” Then there's inflation. Inflation meaning that the money's going to be worth less in the future, so you need to be compensated for that, that's going to increase the discount rate.

16:51 **Justin Anderson** Then there're risks that the company's going to default. Now we're getting into things like corporate spreads. So what we do is look at the typical corporate spread on different bonds, and compare those in the country in question, and we apply that as an additional risk because you're going from government debt to, effectively, corporate debt.

17:07 **Justin Anderson** We're basically building it up—technically it's a buildup model—and eventually, we get to a point where we add an equity risk premium, which is the extra amount of return that I require as an equity investor because I'm taking on more risk—so we add that. And then finally that gets you to your cost of equity.

And then all the cash flows that are coming to the shareholders—we discount them at that cost of equity.

17:33 **Cameron Webster** One term in there is the "equity risk premium." In my experience in the industry, often that's kind of just throwing a dart.

17:42 **Justin Anderson** Mm-hmm!

17:43 **Cameron Webster** You look over time and lots of literature would suggest that there's a number out there that's a typical equity risk premium—but how do we view that? Is it that we know the companies well enough to say, "well, over time, this type of company deserves this type of premium?" Or, "we want to earn this type of premium?"

18:03 **Justin Anderson** It's a great question, and I think it's important because oftentimes we do spend a lot of time on projecting cash flows and not necessarily thinking enough about the discount side as an industry—and what goes into that discount rate.

It's a question for the Mawer Lab that we've been spending a lot of time looking at—specifically equity risk premiums, and how do we actually go about projecting what that should be?

18:27 **Justin Anderson** The idea behind the equity risk premium, fundamentally, is trying to capture that risk. We already talked about that—how much additional risk

there is for being the equity owner because you may not get all those cash flows back. There are different ways that you can go about trying to suggest what an equity risk premium should be for a given company.

One thing you can do, is you can look historically and can say, “in the past, this has been the average returns, and therefore the market is suggesting that this is the equity risk premium.” There's another way to do it, which is implied equity risk premium—and this is my own preferred way because it's forward-looking.

What you can do is you can look at the current index. Take, for example, the S&P 500. You can look at the S&P 500, then look at the constituents of the S&P 500, and can see what analyst estimates are for growth in those constituents and expected dividends that are going to come out of those companies over some period of time. And then, based on those projections, you can actually back out from that on a forward-looking basis what the market is implying that the equity risk premium is given the current index price.

19:28 **Justin Anderson** That's a very powerful technique. We're starting to explore doing that ourselves. We've done more of a historical approach at Mawer, but at The Lab we're looking more at leveraging these implied values that are coming out of indexes, and that's something that should be coming out over the next few months.

19:43 **Cameron Webster** Okay, that's a great answer, and it actually tweaks another question for me in terms of—do you ever reverse engineer the model? You take the market price and say, “okay, what does the market price imply about intrinsic value or equity risk premium?” Am I on the right track there in terms of if we're looking at forward-looking stuff?

20:06 **Justin Anderson** First of all, I gotta say I like the question! And the reason is, I think you're touching on a very sensitive subject for our industry, which is—people tend to, when they're building the models, they're very aware of what the price is. [laughs] It's very tempting as an analyst, as a human, to go in there and say, “well, the market is saying this, and I don't want to look like an idiot, so I'm going to put in these inputs that, it turns out, matches the market pretty nicely when I look at the output.”

20:30 **Justin Anderson** This is a real problem because what happens is you're not actually trying to answer the core question of, "what is the intrinsic value?" You're more just repeating what the market is telling you. And it may be that the market is correct, and that's fine, you can have that debate. But I think as analysts you want to try to be as blind to the market price as possible when you're building your assessment of the intrinsic value.

20:50 **Justin Anderson** One of the ideas that we're, again, working on very hard in The Lab, is this idea of building interfaces between the human analyst and the machines that generate the valuations, and trying to make those interfaces a little more opaque so it's not as easy for the analyst to see exactly what the output is from tweaking a given input. They can see it after the fact, but not when they're going and actually building the model in the process. So that man-machine interface is front and centre right now in The Lab, and something that we're working on.

21:21 **Cameron Webster** You said "Lab" many times ... we had you on before and you talked about Moneyball and automation and how we're trying to get to that at Mawer ... if listeners want to learn more about The Lab specifically, you can go to our website and find [that episode] there.

21:55 **Cameron Webster** Where do you see valuation going in terms of: can you teach a machine to do three quarters of the work? Where's the human judgment going be in the future? Or is there going to be human judgment at all? Maybe that's the ultimate question.

22:12 **Justin Anderson** It's a good question, and I think something that a lot of people are thinking about right now. My take on it is...I think it's sometimes a little bit overblown—the idea that the computers are going take over everything in investing.

The problem with that thesis? I'll give you an example. One of the most basic activities that you would think, as a human, to train someone to do—is folding laundry. It's very simple. I'm personally terrible at it, but it's something—

22:36 **Cameron Webster** [laughs] A fitted sheet?! Who can fold a fitted sheet into a perfect rectangle?

22:41 **Justin Anderson** [laughs] Well, there's perfect folding and then there's my folding—those are

very different things. But the fact is, teaching a machine to fold laundry? Holy—that's a hard problem! People have been trying to do that—there's all these million-dollar devices that are attempting to do it—and they're still horrible compared to [getting] a human to do it. And yet, computers are flying planes and they're landing planes; they're taking people to the moon—they're just doing these incredible feats that are unheard of! You can't fold laundry, but you can fly a space shuttle? What's going on here?

23:13 **Justin Anderson** And what's going on is context is so important. Certain questions are very suitable for humans, others are very suitable for machines. What we're doing at The Lab is trying to figure out what's folding laundry in investing, and what's flying planes. That's something that we're making a lot of progress on. I talked about human-machine interfaces, that's part of that.

23:36 **Justin Anderson** I'll give you another example. Humans, for example, are very good at depth. We're good at diving deep on a specific topic, we're good at gleaning information out of context—so making a judgment on a management team's quality, for example. Very difficult things for machines to do that.

23:52 **Justin Anderson** Where the machines are very good at, is breadth. Machines are excellent at going and analyzing and looking at 1,000, 10,000, 100,000 different things that you haven't looked at as [a] human, because you just can't do that—you don't have that capability—and saying, "hey, if you weigh all this information in a systematic, unbiased way, this is the one that pops up to the surface. Or this is the one that pops up, so you should go look here, human, you should go look there, human."

24:14 **Justin Anderson** It's all about playing to the strengths of the machine and the man, and that's what we're doing in The Lab.

24:20 **Cameron Webster** Very interesting stuff. That's a really fulsome discussion of intrinsic value, how we go about it, maybe how it might change in the future.

We always end with "One Mawer Thought." I know you commute to work by bike. So I'm very curious to know what in your commute to work by bike you can link to investing.

24:48	**Justin Anderson**	Ha! The audience should know that I was not prepared with this question [laughs] but it's a fun question because ... the link that I would make is: biking to work, it's a lot of work to do that every day, day in and day out. [When] you wake up, it's so much easier to get in the car than to get on a bike for an hour and to bike—especially in -30°C Calgary winters.
25:10	**Cameron Webster**	Oh yeah, by the way, there you go. Justin bikes in the winter, too.
25:14	**Justin Anderson**	[laughs] Well, I try—the snow is the breaking point. But yeah, so what is the similarity? I like the idea of, just, patience, of just consistency, of going out every day, day in, day out. It doesn't always feel great; it's not always fabulous and sexy and exciting and all these things. But if you do it, if you do get on the bike every day, day in and day out, it has benefits. You feel better in the long-term, you feel better that day. And I think the same thing goes with investing, if you're just consistent. I love this idea of gradual, pebble by pebble you make the mountain. It's very much how great success happens—you do it one tiny step at a time, and eventually you get there.
25:51	**Cameron Webster**	That's an awesome answer. We could go deeper in terms of the risks to riding your bike, but that would be a whole podcast! Thanks, Justin, for joining us, we'll have you on again soon. Really great.
26:01	**Justin Anderson**	Sounds good, thanks Cam. Take care.