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EP85 | Deep dive: The pharmaceutical industry

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Rob Campbell:	**00:38**	Well, hi everybody, and welcome to a special edition of the podcast, because I'm joined today by not one but two of our analysts within our Research team to talk about some of the work that they've done recently on the pharmaceutical industry. So Amit, Siying, great to have you guys. Welcome to the podcast!
Amit Shah:	**00:55**	Good to be here. Thanks, Rob.
Siying Li:	**00:57**	Excited to talk about pharma!
Rob Campbell:	**00:59**	Awesome. Amit, I'll start with you. You are a member of our U.S. equity team, but you have a background that is seemingly quite relevant for our conversation today, given that you have a PhD in neuroscience; you studied hypertension specifically. So, I'm curious to get your thoughts, just generally speaking, as to how that scientific background—your background in particular—helps in looking at an industry like pharma.
Amit Shah:	**01:24**	Yeah, that's right. I did get a PhD in neuroscience and then transitioned over here. I guess I took a scenic route, like a number of other people. I think it just gives me a different prism through which I look through things. A lot of the scientific method behind investigating hypotheses and testing those with data...I think a lot of that transfers over to the research that I do now, where I'm pretty analytical and focused in that sense.

Rob Campbell: 01:51 Great. And Siying, you're a member of our international [equity] team. Your background is in engineering, and I guess I want to get your sense—there's a case to be made, or at least I've heard it said, that along with technology, the healthcare sector is one that maybe requires a pretty specialized knowledge to be able to analyze effectively from an investment perspective. And I just want to get your reaction: we've got a generalist model at Mawer where we're looking across the portfolio, across industries and sectors...how do you square that or what are your thoughts on that?

Siying Li: 02:21 I think pharma is definitely not an easy industry to look at. There are many aspects about that industry that's very different from the traditional business models that we look at. And I think the ramp up period, for me, when I was looking at pharma companies...it did take a bit longer than others. I think the benefit of coming from... kind of a generalist perspective, is that I could ask kind of very basic questions, and try to understand pharma—if that is a good place for us to invest—comparing to all the other type of industries that we invest in, instead of trying to pick the best company within this industry.

03:06 I think ultimately our goal is to achieve the highest return for investors amongst all publicly listed companies. So, if you've been following our other podcasts, we don't have any allocations to certain sectors or certain geographies. So, I think the benefit of coming from a generalist perspective is also to bring that kind of...very fundamental perspective to look at this industry.

And then on top of that, we also have experts like Amit, [who] I could tap on the shoulder (we actually work quite a bit on some of the pharma companies I looked at), to ask him about some of the questions where one might need a little bit more specialized knowledge.

Rob Campbell: 03:47 Yeah, and I guess that's the key—is just having a culture where the automatic reaction is to defer to the expert or defer to the knowledge. I mean, that's the benefit of a generalist model—is bringing in that perspective and being able to apply it, as you said, wherever we see capital or opportunities for capital around the world.

So, just building on that, Siying, a little bit more—you and Amit have done some work together, I mean, that's why we're here today—but you're on two different teams: U.S. and ex-U.S. What prompted the collaboration that you guys have most recently done together?

Siying Li: 04:16 It's mostly started from pharma. So, I shared within the bigger [Research] team that I'm looking into pharmaceutical companies, and Amit reached out to me and said, "Hey, if you ever need any help, I spend some time in the space so we could talk about it." And we had a few conversations. I also looped him in some of the management meetings that we had—and scuttlebutt meetings—just so that he could also provide that specialized perspective.

Amit Shah: 04:45 Maybe the one thing I'll add, is it really helps to have this sort of common investment philosophy and common process. Because when Siying and I were communicating, we're basically using the same language and we have a pretty transparent process as well. And so, as Siying was talking to management teams and doing scuttlebutt, she's recording all that on a database that all the analysts can access. And so I could follow along in what she's doing, and also then kind of engage with her on some of the stuff better.

Rob Campbell: 05:14 These are pretty global companies too, I would think. And despite the fact that maybe regulations in different parts of the world are different and they may apply differently, some of the themes impacting the pharmaceutical industry, I would imagine are global in nature. Not to mention the fact that many of these companies, despite where they're headquartered, have global businesses as well.

Siying Li: 05:33 Absolutely, Rob. Yeah. That's correct.

Rob Campbell: 05:33 With that, maybe that's a place to start—just some of these bigger, larger themes that you guys have noticed. Maybe, Amit, start with you: what are some of these big picture issues that you've noticed impacting the pharma space over the past few years?

Amit Shah: 05:48 Yeah, I can go through a couple. One of the kind of multi-decade theme that we've noticed is just a shift towards more personalized medicine. And the end stage of this would be something like, we have a full understanding of [an] individual's biologic makeup and we can perfectly customize a therapeutic regime for you, specifically, Rob or Siying.

But we're quite a ways away from that. I think where we've seen a meaningful shift though is basically broadening out our therapeutic toolkit for certain diseases. And cancer is one example of this, where, now you've got many more therapeutics for different types of cancer and subtypes as well, depending on whether you express a specific type of protein. And another extension of this would be gene therapies, where you have therapies specifically for patient populations that have a single gene that's malfunctioning or missing.

I think it's good for patients, but it's also separately perhaps beneficial for pharma companies that see a higher economic return for some of these targeted therapeutics relative to small molecule drugs.

06:58 So that's one. Just one other to highlight is...I think you've seen an increase in focus by some of these big pharma companies; that perhaps a decade ago, they used to be large conglomerates that would also house, in addition to their core pharma business, a medical device business, animal health, consumer health...but you've seen a shift over time where they've divested some of these non-core assets and focused a lot more on the pharma business. And I think what we've seen is some of these divestitures have done pretty well on an individual basis once they've been separated from the conglomerate.

Rob Campbell: **07:34** Siying, what about some other themes that you've noticed?

Siying Li: **07:36** One big theme that I've come across this round of looking at the companies is the decline in return on research and development expenditures for these companies.

So, they've actually coined it a term. It's called the “Eroom's Law,” and what it is, it's really the opposite of Moore's Law. Moore's Law is this law that's widely known; it’s applicable to semiconductors—so, the cost of making a semiconductor actually got exponentially lower year after year of making them. But Eroom's Law is the opposite. The cost of making a drug has actually become exponentially higher to bring a drug to market over time.

Rob Campbell: **08:16** What drives that?

Siying Li: **08:17** There are many factors, but essentially they were factors that come from both the cost and return.

So, if you think about the return costs equation in the numerator—as Amit has mentioned, I think a part of it is that the drugs now are targeting a smaller audience, because they're becoming more targeted towards certain disease areas. Its smaller audience is applicable compared to the small molecule era, when you come up with a drug for hypertension, there are literally billions of people around the world that could use that drug. But now, when you come up with a very specific biologic cancer drug that targets a specific type of protein or mutation, the group of people that could use that drug is smaller. And also the other factor is that there's just more negotiation power from the government, because they're spending so much money on health care.

09:10 I mean, we've all heard about the health care cost trend increasing for government because of [an] aging population, because of more medical therapies coming to market...so they're spending a lot of money on drugs and different types of healthcare treatment, [and] they're negotiating harder as well for these therapies.

So that's on the numerator part of the return equation. And then on the denominator part, it just simply costs more because some of the low-hanging fruits have been captured. If you can think about hypertension, that disease area was much easier, I guess, from an R&D perspective, to treat 20-30 years ago. But now when you need a biologic, you really have to go through a big process of discovering monoclonal antibodies and then applying them to different animal models, taking them through different stages. It's much harder, it's more complicated science-wise.

Siying Li: **10:02** And also there is a higher regulatory bar because there has been cases in the past where drugs have come to market and they've had really bad side-effects and the pharma companies had to withdraw them from the market. So, there is a higher regulatory bar to bring drugs to market; there is more data required from trials. And because the population—as I talked about—are smaller, it's more expensive to do these medical trials because you have to go around the world to find the very targeted population that is suitable to test these types of drugs. So, the cost of bringing drugs to market, the denominator of that equation, is also higher.

Rob Campbell: **10:42** Have companies been able to resolve that in a way through pricing? Or have those governments' purchasing power just been so strong?

Because I imagine, to make a treatment or the cost of the R&D worthwhile, the company has to be assured of being able to price in a certain way—just given the smaller applicability or the smaller market. Does that come to bear?

Siying Li: **11:01** When you look at the cost of bringing one drug to market and then the return that you could get on that drug, like, let's just say a cancer drug—it's still very much of a very high return comparing to low cost. I think I did a back-of-the-envelope calculation [and] it could be anywhere from five to 10x return on the return.

But you have to go through hundreds of thousands of these molecules to bring a drug to market. So, when you put the two—the numerator and denominator—together, as an industry, the trend has just been declining. And some companies have been able to have a much better hit rate than others.

Rob Campbell: **11:40** Well, that was going to be my next question on it—so, it's a general trend across the board, but are there certain pockets of the market that have been able to avoid this? Or is this just...kind of every healthcare company is facing these issues?

Amit Shah: **11:52** No, I think it does apply to the industry, certainly. I think with our process...we're a lot more bottom-up oriented, and so certainly there are some headwinds for the entire industry, but we're able to focus on certain companies that can do well despite some of these headwinds. And so we've been able to find certain companies that have structural tailwinds, for instance.

Rob Campbell: **12:12** So for these companies, what are they doing to counteract this trend toward declining returns? What's effective?

Amit Shah: **12:20** I was going to say just part of what you've said, Rob—just in terms of pricing new innovation at a higher and higher value, I think, is one of the things that they've done. Certainly the like-for-like inflation for branded drugs is not as high as it was probably 10 years ago, but whenever there's an innovative new drug, then there's still the ability for some of these companies to price at a very high value.

Rob Campbell: **12:43** I mean, have you seen this in valuations as well? Has this just made either on a multiple basis? Is health care just more attractive optically as a result of some of these aspects?

In other words: has the industry become more value-oriented because of this?

Siying Li: 12:56 I think what I've seen in valuation for big pharma companies is that the multiples have come down and people are paying less for the pipeline, [and are] more willing to pay for existing assets. And then even in today's world, I see that some biotech companies—they actually get quite a bit of valuation for the expected type of drug, like in a pipeline, because perhaps they have a really unique asset or perhaps they can kind of tell the narrative that they have a really differentiated research and development technology. hereas for the big pharmas, the majority of the valuations seem to be based on the existing drugs that are already launched.

Amit Shah: 13:38 I think for me, yeah, similar to what Siying is saying, there seems to be this bifurcation where you have some of the larger pharma companies whose multiples maybe have come down a little bit, and they're basically trading where you'd expect a distributor to be trading. I think their business model has shifted a lot more towards that of a distributor—where they're really not doing a lot of the R&D themselves, but acquiring much of that in-house. And what their focus is, is really on the sales and marketing piece, as well as on perhaps the later stage of commercialization.

14:10 But then on the other hand, you also have the companies that are generating a lot of value and their multiples are still quite high. Those are the ones that are actually doing some of the core R&D, like on new innovative gene therapies or mRNA vaccines and so on.

Rob Campbell: 14:26 And maybe that's a place to dig in—in the sense that despite these headwinds, we've got a decent amount of pharma exposure within our portfolio, so clearly we're seeing areas that are looking attractive in which to invest. I wonder if we could go through a couple of categories with respect to business models and where competitive advantages lie.

14:44 So maybe, Amit, just to build on that first one—and actually, I don't know if, Siying, this is maybe more appropriate for you to speak to, just given that it's held in our international portfolio— but this idea of completely getting out of the game of R&D and just focusing on the commercialization.

Recordati is a name that comes to mind. Can you talk a little bit more about why that seems to be an attractive business model with competitive advantages?

Siying Li: **15:08** Sure. Recordati is an Italian company, and the industry likes to call this type of business model "specialty pharma." Essentially, they don't do any R&D, as you said, Rob, and they acquire either in-license or they acquire drugs from other companies that [have] already been developed and marketed and they sell it through their sales and marketing network.

15:31 I think the competitive advantage is really around the management's ability to deploy capital, and management's ability to understand how much an asset is worth and be able to distribute it better than others. And on top of that, be able to value the asset very well.

And I think it's actually the investment thesis we have behind the company Recordati—that we think management's ability to allocate capital as well as to execute are very good. And it also has to be in a market where...I think Europe is unique in the sense that they have most of their asset drugs selling in Europe, and Europe is unique in the sense that it's a very fragmented market—many countries, many languages.

16:20 So, there is some difficulty, some barriers to entry in terms of building that sales and marketing network, and also the understanding of how to navigate the regulatory landscape in different countries around Europe. This is sort of a unique business that we've been able to find in Europe.

Rob Campbell: **16:40** And I'm just trying to connect it to the equation with the numerator and the denominator that you were talking about earlier. I guess the benefit here is that they have a lot more visibility onto the denominator—presuming that they've got this discipline in allocating capital. [If] you kind of know how much you're going to spend for an asset, that takes care of the denominator, so you can really focus on the numerator and just making that as efficient as possible.

Siying Li: **17:01** And comparing to a company that's bringing a drug from Phase 1 all the way to a marketed drug, they also have much better visibility on the numerator as well, because a lot of the drugs that they acquire have already been in the market for a few years.

Rob Campbell: **17:16** That's great. I mean, we still own companies that are taking drugs and treatments from Phase 1 and really discovery all the way through. Amit, maybe just one of the recent additions we've had to our portfolio is Novo Nordisk. They seem to be a company that has a tremendous degree of focus around that drug development pipeline. Maybe just speak to that company and why we own it in our portfolios.

Amit Shah: **17:37** We recently added Novo Nordisk to the global equity portfolio, and I think one of the things that's unusual about them is that unlike some of the other big pharma companies that focus on a number of different therapeutic areas, Novo Nordisk generates most of their revenues from a single one—from diabetes. And they've been focused on this market for nearly a century now. They have the largest share within diabetes, and perhaps because of that, they have access also to the best R&D talent working within this therapeutic area. And this has helped them to consistently innovate in this area.

Amit Shah: **18:13** So they've come out with novel drugs like longer-lasting insulin and a new category of antidiabetic drugs as well called GLP-1 agonists. And they're finding new use cases for some of these therapeutics as well in areas like obesity that provides good optionality for them going forward.

So, that's one example of a wealth-creating pharma business that we view as having a good management team and attractive valuation.

Rob Campbell: **18:39** It almost sounds like...I mean, John Wilson has talked about when you're looking at growing by acquisition in general, just a preference that we have [is] for this cookie-cutter growth. So, staying within your circle of competence. It sounds like that's pretty much what Nordisk is trying to do—just knowing their area of genius as it were and sticking it.

Amit Shah: **18:55** That's right, yeah. I think they've had this structural advantage of having limited competition within this one area that they've chosen, and they've also been able to benefit from sort of adjacencies that lend themselves to transferring this core competency that they have in perhaps endocrinology in general, to areas like obesity that lend themselves well to that.

Rob Campbell: **19:16** Great. And Siying, I mean, we do own businesses that are not as perhaps, focused as the two that we've talked about so far. I'm thinking about a Roche, for example. Where does that fit in? And I guess just to direct the question a little bit further, I mean, when looking at pharmaceutical companies that are developing treatments across a range of applications, what gives you as an investor confidence that their ability to be effective in terms of the research and development efforts over our time horizon are going to play out?

Siying Li:

19:46 I think it's very difficult to find the answer to that because it takes a median of 14 years now from the discovery phase of a drug to bring it to market. But in the meantime, you have all these other assets. If you're just following one molecule that is [one thing], but in the meantime you have all these other molecules that [are] moving through the pipeline and being marketed or are falling out of the pipeline. So it's definitely a very big question to answer.

20:12 For Roche specifically, it is, I guess, still a little bit more focused than some of its peers, maybe in pharma...it is a very, very large company. It likes to be more focused on oncology and [the] central nervous system, and these are more difficult areas. So, I think when the company is more focused in its research and development efforts, it gives it an incremental edge.

And then for when it comes to merger and acquisitions—which is a big part of capital allocation now for these large pharmas—Roche likes to buy more preclinical targets compar[ed] to some of its peers, where they spend billions of dollars buying late phase drugs. And that could be better if their competitive advantage is in developing these drugs in the development phase and then marketing them. Typically, if a molecule is acquired in the preclinical stage, they don't have to pay as much, but then of course the risk is much higher than acquiring something that's in the late stage.

21:17 So I think incrementally, Roche, over a long period of time, has been able to demonstrate that. But it is hard factor to track. And sometimes one may not know until five-10 years later, that the average return on capital has declined for this specific company or not.

21:34 I think another big piece for our investment thesis behind Roche is the valuation, so, just how much are we paying for the existing asset versus the asset in the pipeline? And for Roche, at this point, it seems that the market is fairly focused on...they have three large biologic drugs that came off patents a few years ago, and the market is pretty focused on the biosimilar erosion and its impact on Roche and its revenue. So, the market is a little bit pessimistic around the company. So there [are] opportunities that we can trade around the market sentiment versus what we really think their assets are worth. And I think the market, at this point, is not paying too much money for their large pipeline of asset at all. So, valuation is another piece that we do think about.

22:26 And then the last point is portfolio diversification—or its investment impact on the rest of the portfolio. So, usually these pharma companies...they have a completely different cycle than the rest of the portfolio's companies; they're not really affected by the economic cycle. So, that's helpful as well just from a portfolio diversification perspective.

Rob Campbell: 22:48 This whole conversation about what it takes to launch a successful drug actually has me thinking back to another recent podcast that we did on the gaming industry. Meaning, that it's about the ability to generate games that will be hits and then your ability to monetize that over time.

Just thinking about another stock that we own in Genmab, they just seem to be one of these companies that generates hits. They seem to have a high hit rate on developing drugs. Now, I assume you pay up more for that, but how do you think about that? Just...the opposite end of the valuation spectrum and extrapolating some of that success that they've had?

Siying Li: 23:20 Genmab is [one where] I actually looped Amit earlier in the process as well to really try to understand if they do have an edge in their research and development strategy.

Genmab is a very large biotech company and they are more focused on developing drugs from scratch. They don't spend much money on acquiring molecules or acquiring other companies compared to other large pharma companies. And I guess the differentiation between biotech and pharma is whether one does its own distribution or not. And as of now, Genmab generates most of its sales from royalties, so it doesn't do its own drug distribution.

And, again, it's very hard to know, because the problem with these biotech companies is that they don't have as many assets in their portfolios. So for Genmab, actually, one asset's called DARZALEX® [and] that's more than 50% of the net present value of the company. So, when you have one hit drug, (and DARZALEX® is a $10 billion drug), so when you have one [large] successful drug like that, of course your return on investment is going to look phenomenal. I think one calculation I made was they had over a 1000% on their research and development. Of course, as an analyst, you can't just extrapolate that they can have this type of return on the next hundred molecules and then this company would just be worth infinite value.

24:50 So, the way that we investigated their research and development process was through a two-pronged process: one by looking at it theoretically and the other one, empirically. Theoretically, we want to understand whether the design of [the] research and development process was unique. We interviewed different experts, as well as read different scientific journals to understand, "how is their researching process different from others?" And what we found is that they have this process where it allows them to create bispecifics, which is the next generation of antibodies. And that's where most of their focus is on—bispecifics. They have this process that allowed them to create bispecifics more effectively, both from a cost and a time perspective. We think that their process allows them to essentially throw more spaghetti at the wall, and see which ones stick. And it is differentiated from some of the other companies when they try to create bispecifics.

Siying Li:

25:54 Empirically, we also wanted to look for evidence that... theoretically, they have this process they can test more bispecifics out, but is it actually effective? Is it actually a more effective molecule than what other companies are bringing to market? And we tracked how bispecifics in clinical trials have evolved over the last two years and [were] able to find that their molecules progressed faster through the phases than, I guess, some of the other companies that we were comparing them to that also claimed to have a bispecific platform. And we also saw more bispecifics developed by Genmab [that] came into clinical trial.

So, both of these pieces of evidence gave us some comfort that their technology is differentiated and potentially more effective than other companies.

26:50 The caveat is that the process for recent development is very long. The median time to take a drug from preclinical discovery phase to market phase is 14 years, and there are many things that could happen during that period of time.

A competitor could launch a product that's a few years ahead of Genmab. And maybe their product is not as effective as that of Genmab's, but [has] already [been] taken out by patients and doctors, [so] the industry [has] less inclination to switch treatment. Or, that other companies could just get lucky and Genmab could be looking at thousands more molecules in the same therapeutic area, but another company could look at fewer and just come up with a more effective drug—because a lot of it, in the drug discovery industry, is luck related.

So, I think we take the evidence that we collected through our research process [while] understanding that there's also a lot of different factors. Not everything is under your control when it comes to drug development.

Rob Campbell: 27:55 Got it. So, just thinking back on some of these various businesses that we've discussed, it seems like ways to combat decline in returns are to get focused, to have better technology, to focus on an aspect of the drug life cycle where you think you have a competitive advantage, or to buy these companies when they're a little bit cheaper, which I guess is a time-tested element of having a margin of safety.

Before we move on, we've talked a lot about pharma companies…there are other ways to get access to healthcare trends other than specifically through pharma companies. Wondering if you can talk to some of those—either that we've looked at or that we own in our portfolios today.

Amit Shah: 28:35 Yeah, that's a good point, Rob. I think we try to benefit from suppliers to these pharma companies that are more agnostic to what specific innovative drugs are actually commercialized. And so we've got a number of those within the U.S. equity portfolio. Ones that come to mind are Waters™, which develops instruments for the quality testing of pharmaceutical drugs. They have a high share within there. And then a few others as well are West Pharmaceutical and Avatar, both of which develop the packaging for these pharma drugs, especially the biologics. And they have a high market share as well in these areas.

Rob Campbell: 29:19 I think what's interesting there is just…the approval process. Where, it's not just the drug that gets approved, but it's also the way the drug is delivered. So, the dispensing mechanism is part of the drug approval, which like we were talking about before with Siying, it's difficult to switch out of once you've agreed to a particular supplier.

Amit Shah: 29:36 That's right. These manufacturers are often specked into the approval, and the packaging material is a pretty low cost relative to the actual retail value of the drug.

So, the incentive for switching over to another vendor that might be slightly cheaper… it's just not as compelling.

Rob Campbell: 29:56 I mean, broadening out again: we're recording this podcast effectively exactly a year since we've been working from home. And…[it]s hard to get through a conversation about pharma or health care without asking how COVID has impacted the industry. And I guess thinking about the near-term first—just what we've seen over the past year, or just over a year—how has that impacted some of these trends that we've talked about?

Amit Shah: 30:21 At least some of the companies that we cover within the U.S. universe, we've seen really a bifurcation of response, where you have some of these companies that have benefitted a lot from COVID-19. These would be companies that are involved in diagnostics for the virus, and also ones that are involved in the bio-processing of the therapeutics related to COVID-19.

Amit Shah: 30:44 And then on the other hand, you have several companies that have been negatively impacted from fewer elective surgeries, for instance, in hospitals.

And so I think the short-term to medium-term impact on the industry would just be normalization—as you see hospitals beginning to increase their capacity again, recovering from the shutdowns, as well as maybe lower demand for things like diagnostic tests and therapeutics related to COVID-19.

Rob Campbell: 31:15 Siying, what about longer term? What are some aspects of COVID that might stay with us? (In the context of what we've been talking about?)

Siying Li: 31:22 In [the] longer term, I think some of the companies that we see even outside of health care—for example the testing inspection certification companies that we invest in—they're talking about requiring more PPE equipment to be tested and inspected. And governments [are] talking about having [a] better inventory of these items should another pandemic occur.

I believe [that] in the healthcare system itself...other than the drugs that are vaccines immediately related to COVID, I agree with Amit—I think I just see a normalization over the long term.

Amit Shah: 32:00 I think too, over the long term...if you reflect on how we can deal with the next pandemic better, you might focus on things like just a better centralized response by governments, as well as more investments in infrastructure—that we can ramp up diagnostic testing and ramp up manufacturing and distribution of vaccines the minute that they're approved.

32:23 I think the benefit of having some diversification within health care is that we can perhaps benefit from some of these low-tech investments in infrastructure. And this would be maybe a company that we own in the portfolio like AmerisourceBergen, which is a distributor of drugs, and some of the packaging companies as well that we talked about, Avatar and West Pharmaceuticals. These are all low-tech solutions, but I think that they could all benefit from investments that could be made down the line as we consider how to react quicker and more efficiently to the next pandemic.

Rob Campbell: 32:57 I mean, we've touched on this a little bit, but what about the role of government? I'm just thinking about this idea of...it's harder and harder to produce or develop new drugs or treatments; there seem to be clear benefits toward this more personalization of treatments. But if the economics aren't there for companies or businesses to invest, do you see an increasing role for governments in effectively funding some of this research and development over time? Or, how do you see that partnership between the private and public space evolving?

Amit Shah: 33:23 Absolutely. I think the government is already playing a big role in terms of funding healthcare expenditures by various government programs like Medicare and Medicaid in the U.S., for instance. It would probably account for at least half of all healthcare expenditure in the U.S. And so, I think that role is only going to get bigger over time. You think about the aging population, you're seeing that. And some of these entitlement programs like Medicare, they're basically focused on the 65+ population, which is only getting larger. And so just by virtue of that, I think you're going to see the government playing a bigger role in all of this.

34:00 The other thing to keep in mind is that these pharmaceutical drugs...they only account for a small portion of overall healthcare expenditure, with very large portions being what's spent on hospitals and what's being spent on doctors that work at [those] hospitals. And so I think there's a lot of attention that's often given to the pharmaceutical industry, but there's many other ways that we can think about making the system more efficient.

Rob Campbell: 34:27 So, I guess where does that leave us? With respect to the pharmaceutical industry in general? I mean, these headwinds...I'm detecting a sense of optimism. Knowing that it's a Mawer podcast, I presume that it's going to be that we "got to look business-by-business and look at things on a bottom-up basis." But are we trending in the right direction globally on this topic? Or [are there] some of these improvements, like you said, on the distribution side that can make things better?

Amit Shah: 34:50 Yeah, absolutely, Rob. From Mawer's perspective, when we make investments, we still have to look at the businesses one by one, fundamentally. I think as a sector, there will always be opportunities to invest, whether it be from [a] valuation perspective or from finding the business model that's really brings a differentiated value to the consumers.

I see that the large pharmaceutical companies…they may evolve into either one that's even better at doing merger and acquisitions, finding the better preclinical targets, and then develop[ing] them through bringing them to market. Or, there are many other types of businesses that help the pharmaceutical companies offload some of the operation process[es], such as these contract outsourcing organizations—they help pharma companies conduct clinical trials. Or, there are outsourced biologic manufacturers. One company called Lonza, for example, they build these plants around the world to help pharmaceutical companies have more flexibility in manufacturing capacity for when they manufacturer biologic drugs.

So yes, there is that trend of declining return, but there is also still, many therapeutic areas to target and many ways we can combat disease. And when there are needs, there are opportunities.

Amit Shah: 36:20 The few other things I'd highlight are just like we spoke about earlier—there's a pretty robust demand for all of this, for innovative pharmaceutical drugs as the population ages. And then, also one of the reasons that we like pharma is because it tends to be uncorrelated with the economy. Even as there's a recession, what have you, that people still need medicines for chronic conditions.

And then the last thing I'd say is just on regulations. We always take a negative bias towards them, but in reality, I mean, these regulations are also in place to lock the status of a given therapeutic for a number of years and ensure that the pharmaceutical company can generate a reasonable return from them. And so, I would see it as more of a mixed blessing than chronically negative.

Rob Campbell: 37:06 Perfect. Well Amit, Siying, that seems like a good place to end. Thank you so much for coming on the podcast and talking about the work that you've done together. I certainly learned a lot about the industry in general, as well as where we've been allocating capital. So very much appreciate your time today.

Amit Shah: 37:22 All right. Thanks, Rob.