MOI GLOBAL

IPG Photonics: Dominant Laser Company Run by Owner/Operator

Chris Crawford of Crawford Fund Management presented his in-depth investment thesis on IPG Photonics (US: IPGP) at Best Ideas 2019.

The following transcript has been edited for space and clarity.

Before I start, I'll put up my usual disclaimer notice that this should not be considered as investment, legal or tax advice. This is for instructional purposes only, and any securities that we talk about may not be all of the securities that we hold in our funds or recommend.

It's important to follow up on prior recommendations, so while this is not investment advice, I like to provide an update on the ideas that we presented here in the previous five years that we've done this. In the past year we closed out Ubiquiti Networks after several years of owning it. It got off to a rocky start a few years ago, but it ultimately proved to be a successful investment, increasing about 3.5x from when we started it. The two that we still have outstanding are last year's idea, Diamond Hill, and Amerco, the U-Haul parent. We continue to hold those and believe very strongly in them. We believe that the thesis we presented in this forum is still valid. Neither idea has yet produced the returns produced by the three ideas that came before it, but that's the nature of investing: you have a period where ideas do not work or even have setbacks before they ultimately work. After doing this for long enough, we know that some of these ideas will not work and they won't all be successful. We just want to have a good batting average and a much higher gain-to-loss ratio across the spectrum of ideas. Amerco and Diamond Hill are still important ideas and and big positions for us.

This year's idea is IPG Photonics, trading at about $126 a share. This is a laser company, a dominant number one company that produces industrial lasers that have durable competitive advantages. It's a very innovative company and has been the technology leader in the industry for decades. They have long-term secular growth opportunities as lasers become more important in industrial materials processing, and now, a variety of new applications. They have a fantastic management team, with a Russian immigrant owner-operator CEO who founded the company when he was 51 years old — a very late start for an entrepreneur. It puts him in the same category as Ray Kroc who founded McDonald's in his 50s. He's created a $6 billion market cap company from essentially nothing, with only his knowhow as a physicist in Russia who came to the U.S. He's a very shareholder-oriented manager. We'll talk more about him later.

The stock is very much out of favor. It's declined more than 50% recently due to fears over tariffs and an industrial slowdown. We think the decline in the stock is dramatically more severe than the reality of the fundamental issues that we're going to see related to tariffs. We have 45% upside to our $182 fair value appraisal, and we think the fair value in this type of a company is poised to grow rapidly over time. That $183 target price each year, if the company continues to execute, can become larger and larger, therefore creating more upside. There are two ways to win: one is closing that gap to fair value, and the other is the fair value itself growing over time.

What are lasers and what are they used for? We think of lasers as something from Star Wars

or weapons with beams of light, but there's a wide array of incredible industrial applications of lasers that are becoming increasingly important. Cutting and drilling is the biggest area. Traditionally, metals are cut with saws and different types of heat instruments. Lasers have revolutionized the cutting and drilling of metals by allowing a highly focused powerful beam to rapidly heat the metal and vaporize it, and make precise cuts that leave no kerf, which is a lip or an edge that's created with traditional cutting methods that lowers the quality of the product or requires additional processing to eliminate it. With a laser, you don't have that. It's a lower-cost, faster, more accurate, higher-quality way to cut and process metals.

The same is true with welding and brazing, another major application. This is attaching pieces of metal together. Traditionally, it was a very manual labor-intensive process. As lasers proliferate this and become more accurate, less human labor content is required to make very precise welds. In fact, there are some things that are not even possible for humans to do that lasers are now doing. Things that required riveting with aluminum, for example, are now completely enabled by lasers.

Marking and engraving, where you want to put a design or emblem, or stamp a number or a logo onto metal, can be done very precisely with lasers.

3D printing, which is a growing part of manufacturing business, is another area where lasers are going to play an increasingly major role. The vision for 3D manufacturing is that someday we'll have a digital schematic — a CAD program or a 3D diagram of a product or a part you want to produce — which you'll simply put into a machine, and the machine will additively manufacture that, attaching the appropriate materials to make that part, which will be usable in the end product. The vision is that if you can do that at scale with enough speed, that's going to revolutionize many areas of manufacturing. Right now, we're not there. Right now, 3D printing is mostly used for prototyping and design work, but increasingly, it's going to be possible to make the product with alloys — with metals — and lasers are going to be the key enabling technology for that. IPG is right in the center of that.

Cladding is the protecting of existing metal assets so that you can prolong their life. Lasers play a big role in adding a cladding or protective coating to something.

Another area that's just starting to grow is ablation, which is using high-power lasers — pulsed lasers — to remove paint. Paint removal has been a very labor-intensive process; it's also not healthy for the people who have to be around that process. The Department of Defense spent $1 billion last year stripping paint from ships and airplanes. The ablation process is only a small part of that market now, but cleaning of metals is going to be a big new application for IPG lasers, where they innovate at the high end.

All the things I've just mentioned are in the category of materials processing. Then there are emerging fields like medical where, for example, urologists are going to start using IPG's lasers to break up kidney stones. There are other applications at a more micro level that require lower-power lasers with different types of pulses, such as communications and projections in cinemas. There are all kinds of new markets for this that are not yet even in existence.

What are the various products that IPG sells? About two-thirds of their revenue comes from high-power continuous-wave lasers. These are lasers that produce at one continuous speed. They are the bread and butter of IPG's lineup. Next is mid power. The high power is where most of the innovation is occurring. If you look at the history of lasers, they continue to increase in power, which enables more applications. IPG is the technology leader at the high-

power end. Its competitors— mostly Chinese — that are trying to copy and undercut cost, come in at the lower end, two or three years behind IPG. The mid and lower end gets gradually commoditized. IPG still plays in that segment and it's mostly a volume business, but they continue to move upstream with their products.

Pulsed lasers — 10% to 15% of IPG's revenue — are lasers that come out in a pulsed on-off fashion, and have a variety of applications. For example, paint removal requires a pulsating laser as opposed to a continuous laser. Ultra-fast lasers is a small, emerging and highly R&D-intensive part of the business where you do more finely tuned, smaller drilling in areas where you don't want to create any thermal damage to the surrounding materials. There's a wide array of different applications for lasers, and as you innovate with different types of spectrum and pulse schemata, you can open up new markets. QCW stands for quasi-continuous waves. These lasers are a hybrid between the pulsed lasers and the continuous-wave lasers, enabling finer welding and more precision in the output of a product.

A small part of IPG's business is systems. This is not just the lasers, but it's the products that go around them. These are software-based integrated systems that allow you to do a full machine tooling solution or a full manufacturing automation solution that incorporates the lasers. These are basically compatible software systems that interface with IPG lasers.

Providing accessories is a small but high-margin part of the business, along the lines of the razor blade model, where you have to replace the cutters and the switches and the heads of the lasers. Telecom is another big area, where IPG is producing amplifiers. They did an acquisition in this space recently where there's a combination between amplifier technology and laser technology. Finally, service and support is 5% to 10% of revenue. That's another nice piece of the business where you produce a product and you continue to service and support it while it's out in the field. It's also a key part of the competitive advantage — having the service organization and the financial wherewithal to support your product.

What is the definition of a laser? There are three main features or metrics that define a laser. Firstly, the wavelength that it operates in: this ranges from short wave, ultraviolet, all the way down to long wave, infrared; there are lasers at all different parts of the electromagnetic spectrum. Secondly, the pulse duration: continuous, pulsed and quasi-continuous. Thirdly, the power level: low to high. Currently, the bulk of the market is in the one- to five-kilowatt range, and that's where IPG is dominant. The high-power part of the market — the over six-kilowatt range — is where IPG essentially owns the market.

IPG's customer base has grown steadily over the years. They have over 3,000 customers. The top five represent about 30% of their revenue. Those tend to be blue-chip customers like Fiat, Volkswagen, BMW and Boeing. Han's Laser is a big customer in China that packages IPG's lasers into other products that are sold on. They work with the best of the best. They shipped 46,000 devices last year, which is nearly double the 25,000 devices they sold five years before.

Customer benefits are:

- faster processing speed — the fiber laser can work two to four times faster than the traditional CO2 laser;
- lower operating cost — a very important payback equation for the customer;
- easier systems integration — IPG makes their lasers to fit with other types of manufacturing systems;
- small footprint — they have a much lower footprint than their competition, which

saves valuable factory floor space;
- efficient cooling — IPG lasers are very efficient in their energy use, which creates less need for cooling, thereby reducing the cost for the customer.

In terms of IPG's global footprint, there are three major places where they make product and do R&D. Massachusetts in the U.S. is their largest facility, which is where they do a lot of their innovation. That's where they produce the diodes, which are the most sophisticated part of the product and where the core of the intellectual property resides. They have facilities in Germany and Russia where they do component and final assembly. Russia is a major location from where they sell into China. There are almost 6,000 employees in the company. About 44% of sales go into China, and the balance is divided between the rest of Asia, the U.S., Germany and the rest of Europe. About one-third of the China sales stays in China and is sold into China as an end product, and about two-thirds is used as an input in further manufacturing and sold around the world, so they're not getting 44% of their revenues from China per se in terms of where the end product is going.

The employees are spread pretty evenly around these different regions of the world. I spent a day visiting the U.S. facility, which is an impressive operation with a lot of sophisticated processes going on. I got to meet and speak with many people who work in the guts of the operation, and I found them to be impressive, serious people. The facility seemed well organized and well managed.

What are the growth drivers in lasers? We see a long runway of growth for lasers. If you look at the $80 billion materials-processing market, lasers are only a small portion of that — about $14 billion of that $80 billion. That $80 billion is going to continue growing with the general economy, and the laser-based component of it will go from being a relatively small percentage now to being probably half to two-thirds of that market over the next 10 to 15 years.

In terms of the industrial segment of lasers —just one small component — fiber lasers are projected to increase from about half of it to about three-quarters over the next eight years. That's a trend that's going to continue throughout all the different laser segments.

IPG has experienced fairly consistent growth of about 15% to 18% a year, and that growth rate could continue. Our valuation models don't assume that, but there is the potential to [beat our estimates] and continue to grow over the long term.

Looking at the growth of end markets together with projections by an industry group that tracks this market, virtually every segment is growing. The applications in traditional materials processing — welding, cutting, marking, engraving — are growing steadily, while the new markets — sensors and instruments, R&D, defense, medical, projection technologies — are all growing at faster rates. Not only are the existing markets growing, but new markets keep getting added. In five years, we should see continued growth of all these segments, but there'll be another stack of five or six new major markets on top of it.

Some of the new applications include: medical — breaking-up of kidney stones, for example; projection displays —lasers can produce a much higher-quality picture with less power consumption for movie theaters, with more control over the software and the management of the product; systems will increasingly be a big market —selling software and other tools to integrate around the laser; and the ultrafast segment. These are all important new markets.

It's also key to talk about the cost advantage that IPG has. It's the largest-scale player and is

vertically integrated. As they've grown their revenues and the number of devices sold — and their production has increased to 10 million tested chips in 2017 — their cost per watt has decreased so that it is now about 20% of what it was 10 years ago. With their scale, this increase in production and reduction in cost keeps them in front of everybody by about two to three years.

To summarize the elements of their durable franchise, they have 80% market share, which has been accumulated over many years. The have a low-cost position, with their fiber lasers 2x to 4x the speed and half the cost of traditional lasers. They have a key advantage in diode production, by producing their diodes mostly in the U.S. but doing assembly overseas. It's a good way to protect intellectual capital — separating out the different parts of the manufacturing process so no one facility can see the entire process. That's a key part of protecting their technology. They have a big lead in technology, and are currently the only viable supplier of QCW lasers. It will probably be four to five years before anyone challenges them in that space. They are vertically integrated, making all their own components so competitors can't replicate, but also so they're not susceptible to shortages that competitors often suffer from. They are strong in proprietary IP, with 240 patents and even more pending. Even more important than the patents, in my opinion, are the trade secrets and the knowhow that they have in the manufacturing processes. In making their diodes and various other components, they've developed specialized and unique methods over many years which would take competitors a long time to understand, if they could ever even discover them. They have a powerful brand name and are trusted by blue-chip customers who know they're dealing with a company that's going to be around for decades into the future and can support the product and honor product warranties. They have a strong balance sheet, with $1.1 billion in net cash and no debt. The company has always been run that way. They want to have no dependence on capital markets to fund the business, and they want to be in a position, as they have in the past, to take advantage of downturns when competitors are struggling, to be able to go in and make acquisitions or continue to invest in R&D when others are cutting back.

The key member of the management team is Valentin Gapontsev. He's one of the great pioneers in the space, a visionary. He is quoted as having said a long time ago, "My dream is to see lasers, like computers, become a tool of choice in mass production." That vision is definitely becoming a reality. He's a serious, scientific person, spending his days working on scientific issues, publishing papers, working on manufacturing processes. He's got a great blend between being a scientific thinker and a business thinker — certainly one of the best I've ever come across. He doesn't spend a lot of time glad-handing Wall Street. He's quite hard to understand when he speaks due to his heavy Russian accent, but you can tell the passion and knowledge that he has when you hear him speak. They have a lean management structure, with hardly any layer of middle management. Everyone seems to work long hours and is focused on their jobs. They have hard-nosed skeptical managers who think and act long term. It's a company culture focused on objectives, without a lot of meetings. Management compensation is amazingly reasonable and fair, for a company this good. It's one of the best ratios of value to competence that I've seen in a company.

In terms of the rest of the management team, there are a few Russian colleagues of Gapontsev who co-founded the company with him who are still in the business — a lot of experienced, long-tenured executives. Timothy Mammen, the CFO, is one of my favorite CFOs in any business. He has the skillset of a COO or a CEO in addition to financial savvy, and has been with the company a long time. He's very communicative and detail oriented, and will talk about problems and challenges just as much as he'll talk about things that are going

well. I find him to be extremely helpful. I also like Trevor Ness, head of worldwide sales. He spends a lot of time out in the field, in the markets, and has great knowledge of all the end markets and what the customers are thinking of doing. I'm very comfortable with the management team that's in place.

Corporate governance is excellent. They have solid practices in place on the Board of Directors in terms of director independence and various features. I won't go through all the details, but it's a well governed company, which is what you'd expect when the CEO owns so much stock.

To summarize the key investment tenets, the company has substantial opportunity for growth, rapidly expanding applications, a large and growing market, fiber lasers gaining share, strong payback for customers, and lots of new product segments. Their market position is dominant, they have a low-cost position, and vertical integration. There's a nice alignment of interest between us and management. They're excellent communicators, very shareholder oriented, and have superior business economics. I'll go forward to an appendix slide to look at return on invested capital, which would be helpful to see. These graphs are produced by a tool called HOLT, which is an excellent tool for looking at return on invested capital, because it corrects for a lot of different capital conventions across industries. IPG has a history of very high and growing return on capital. It's the spread between the cost of capital and the return on invested capital that defines how much value you're creating for shareholders each year, and that's been a high and growing number. The fact that they've been accumulating cash as a cushion and safety mechanism has actually depressed this number. If you correct for that cash, these returns continue to rise. The green dot on the graph represents the market implied return in the current stock price versus our scenario where the returns fade. But there's a reasonable chance returns keep growing, as we'll see later when looking at valuations. This return on invested capital is composed of asset turns and margins which have been rising. That's the point I'm making on return on invested capital rising.

It's the most profitable laser company, and they're able to self-fund all their initiatives with their balance sheet. Valuation is attractive across a variety of methods. Ultimately, the company could be an attractive takeout candidate from a larger industrial company. This is a niche-dominating company, so I could see a large conglomerate paying a high multiple in a strategic deal to get access to both the technology and a growth market. They're not looking to sell the company any time soon, but that could be an exit after the company is done creating value on its own.

Finally, there's a good ESG platform here. There's energy being saved. There's material waste being saved. It lowers the carbon footprint for customers who use the product. For those who care about social governance issues, that's a nice point to make.

What are the risks and concerns in the investment? They are exposed to a lot of global and industrial end markets, which means they are not recession proof. We've owned this company twice in the past —in 2011 and 2016 — and had a very successful investment with it. We bought the stock during tough industrial downturns where we thought the stock was disproportionately hit. We sold it in late 2017, early 2018. We didn't think we'd get a chance to come back in. The recent 50%-60% decline in the stock price is due to similar concerns, and it looks like the same playbook is happening all over again. It could get worse before it gets better. If we end up having a full-blown recession, there could be lack of visibility and a downturn in orders. There could be negative results for a while. We've built that into two of our scenarios.

Exposure to a trade war with China is a risk. A large part of IPG's sales goes into China, so the increase in tariffs to 25% definitely impacts their products. We think there's a reasonable chance there'll be some kind of resolution to this — that it's all going to look like a terrible fight for a while, but that both sides have incentives to resolve the tariff issues. We're both each other's largest trading partners, and maybe we're making a big stand to try get some concessions on things like intellectual property protection or access to markets. If we can get some concessions, I think both sides are going to want to get to a resolution. Right now, the fear is built into the stock price and if we get a resolution, that will probably be positive for the company.

Increasing competition at the low end of the market has been ever present for IPG, but more recently, there have been a lot of Chinese competitors selling below cost. Some of them might be subsidized by the Chinese government — it's never a good thing if you have competitors with a big pocketbook subsidizing them. Fortunately, it's affecting mostly the low end of the market, which is causing some weakness in IPG's results, but we think this is something that just comes and goes over time. We've seen the same issue in the past.

There's a risk of IP theft or copying. I mentioned that segregating manufacturing is one way to protect against this. They seem very paranoid about how to structure their business so that their intellectual property is protected. They have been operating successfully in places like Russia and China for a long time, so they seem to be more savvy than the average company in that regard.

There's a heavy investment in working capital required due to their vertical integration strategy. They have a lot of capital sitting in working process inventory. They also believe in holding a lot of inventory so they can service their customers well. This is something we've penalized them for in the models, but it is a component of the business. It could be viewed as both a positive and a negative.

Currency exposure: with 80% of their sales outside the U.S., a strengthening dollar is definitely something that hurts. Some people worry about their exposure to Russia, given the political ups and downs that we have with Russia. It's worth noting that only 5% of their sales go to end markets in Russia and more like 15% to 20% of their cost of goods sold is created in Russia, so when the ruble drops, that's a net positive for the company — there's no currency issue to worry about there. A greater worry is whether they would ever get expropriated. The CEO was just put on this Russian oligarch list, which seems unjustified for someone who's a U.S. citizen and who's been an entrepreneur in this country for a long time. It seems he was put on the list just because he's a billionaire. He does not seem to have any connection to the Putin regime. Despite all of this, they've managed to successfully navigate these political waters for many years. They've had operations in Russia for 25 years, and there's never been any kind of disruption despite all of the ups and downs in the political climate.

Finally, I'll just point out the 3D printing market has not yet lived up to its hype, but we do think it's ultimately a long-term opportunity, and lasers are a key part of enabling that.

Coming now to valuation, we've appraised the company at about $182 a share. We used multiple methods. Method one is a DCF valuation where we have three different scenarios: a base case, an upside case, and a downside case, where we weight the results from each of those three scenarios to come up with $183 as the DCF valuation.

Method two is a traditional shortcut method: enterprise value to EBITDA, based upon long-

term averages. EV to EBITDA has been in a band of roughly 7x or 8x to 20x over time. We're currently down at the very low end of that band. Every time this multiple has been down at the low end of the band, below 10, it's been a good time to own the stock — it's performed quite well thereafter. The same is true on an EV-to-revenue basis and on a price-to-free-cash-flow basis. On a relative-multiple basis, we are at a point where it's typically very attractive. Using a 14.5x long-term average, chalking off some extreme periods in the past, gives us a $193 appraisal.

We also like to look at price to book relative to the company's capacity to generate return on equity. I won't go into a lot of the details on this, but we basically assign a 3x book value multiple based upon the demonstrated ROE capacity, and that gives us a much lower valuation of $122. We think this is the least valid method because the company has been plowing up cash, and that's been depressing the ROE.

Finally, the HOLT scenario has a market-implied value. We look at the gap between the market implied and our scenario of how much the returns on capital will fade. That gives us about a $219 valuation.

We weight the DCF at 70% and each of these other three methods at 10%, and that gives us the blended $182 per share. None of these methods gives any credit for doing value-accretive tuck-in deals. They seem to do one every couple of years where they buy a small company. It's not a major deal. It's not large enough to draw their top line — it's more been to get access to technology — so most of the growth they've put up has been organic. We obviously give no credit for the big takeout scenario I mentioned with the large industrial conglomerate — doing a strategic deal. That gets us to $182.

I'll look briefly at the three modeled scenarios, starting with the base case.

We look at a variety of numbers, including revenues, margins, working capital, capital spending requirements, all the way down to free cash flow. We also penalize for stock compensation, which is very modest in this company. Then we do a traditional DCF valuation model. In terms of our growth scenarios, the company has steadily grown 15% to 18% on average, with years that are higher and years that are lower. We've modeled in a significant downturn in 2019 of negative 8%. That would be the worst year they've put up since the financial crisis, and there's a chance it won't be that bad, but we've modeled that in as a base case for 2019 given the slowdown that we're seeing and what the company's been saying. We predict a big bounceback next year of 20% simply because you can't hold back the growth in these markets. We think that after a negative year, there'll be a big growth surge. If you look at the downturn in '09 where they were down 19%, they grew 61% the next year. This time, we have it being 8% down, 20% up. They're growing off a much larger base now, so the numbers might be more muted, but who knows — it could be an even bigger spike than that in the recovery. We then resume a prediction of fading growth, going 15%, 13%, 11%, 10%, and ultimately 7% after year five in the terminal value. That's a significant slowdown in our base case — that's essentially saying the heady growth years of this business are over and we're going to spend the next five years fading down to a level that's still above the economic growth average but not anything like what was there in the past. I think there's a big chance they could beat this fade, but this is a conservative base case.

As for margins, we've assumed no further scale gains coming, so holding a line at 42%, down from the big surge that they had in 2017. We're saying that scale advantage is done. Again, they can beat that. We've modeled working capital intensity to be roughly the same as it's been in the past. We've given them some benefit from the tax law changes in the U.S., but

they're operating off of a blended global rate which is higher than the U.S. rate. Looking at capital expenditure, we've assumed they have to continue investing as they have in the past despite the fact that their growth is going to fade. We've modeled stock comp the same. That's how we get to between $188 and $189 per share in this scenario.
Then we do an upside case, where the downturn in 2019 is less severe at only minus 2%, you have a big recovery year in 2020, and then it fades to a number that's still lower than what they've been doing in the past five years but still very healthy growth, and 9% in the terminal scenario. We assign a higher terminal multiple of 25x free cash flow to reflect that 9% growth. We give them a small benefit for working capital management, and we give them more capital spending requirements to sustain growth in that scenario.

Finally, in the downside case, we have a big down year — negative 12% — in 2019, and then they don't recover any growth. The commoditization and competition in China is a permanent change, so we assume they lose part of their competitive advantage and become basically an economic grower within five years. They also lose margin, declining from 45% to 38%.

The following are excerpts of the Q&A session with Chris Crawford:

Q: Could you talk more about the market and how big you think it could get over time? What is laser technology replacing or obsoleting?

A: There are a number of different markets here. The biggest and most important one is this materials processing business. This is the cutting and the drilling — traditional machine tooling. This is a lot of older legacy technology where you have machines physically touching and impacting the material. These are blades, machines that are hammering and heating material, traditional welding machines. These are markets that have been around for decades. The lasers that are not actually touching the material allow you to act at a distance, which allows you to be much more focused. It allows you to do things that humans can't do. It's inherently more efficient. It produces a higher-quality product and is more cost effective for the customer. We see it attacking primarily this $80 billion existing market which is growing with the economy, but this new market will grow much faster as it penetrates and gains share.

In addition to that $80 billion, there's probably another $80 billion of applications that are out there. There are a lot of smaller applications in markets that are worth maybe $500 million to $2 billion, like medical components, like the cinema projection business, like the ultraviolet lasers that can do more fine tuning, that allow you to work with different materials such as plastics. If you add up these dozens of smaller markets, I think in aggregate they could be another $80 billion. In terms of IPG, with a couple of billion in sales, competing in a market where they've got cutting-edge technology that's gaining share, I think they can grow for many years. I can imagine them growing for another 10 to 20 years, not necessarily at 18%, but perhaps in the mid-teens for a long time, which would mean that my models are way too conservative and that valuation can ultimately grow to be a lot bigger over time.

Q: Could you please elaborate on the high or apparently high working capital needs?

A: It is very high relative to a other kinds of businesses, and it flows out of their strategy. Being a vertically integrated company where they insist upon producing all of their own components, it multiplies the number of things that they have in their working process inventory. Having to stock diodes, amplifiers — all sorts of components and materials —in their manufacturing centers is what contributes to that working capital. The other factor is that it's a service-oriented business. They want to provide the best service in the industry.

They maintain a greater inventory of finished goods than their competitors so that they're able to respond quickly to customer needs, to replace a faulty machine or make good on a warranty. These are all things that allow them to be able to deal with blue-chip customers and lock out competitors who don't have the capital and accumulated organization to support that. It's an intentional strategy. I think it flows from the CEO, who is the type of person who likes to control every aspect. He's a scientist and an engineer at heart, and he likes to be able to maintain control and not leave things to chance. In other industries where there are more fabless manufacturers, more virtual companies that like to outsource a lot of things, you'll find much lower working capital requirements. As a result, they don't capture as much of the value chain, they don't have as much competitive advantage, and they have more technological threat risk than a company like IPG. There are tradeoffs in business in this type of decision making.

Q: Can you talk a bit about pricing power given the large market share, and also, what percentage of capex could be considered maintenance?

A: Those are both excellent questions. In terms of the maintenance capital question, about three-quarters of their capital spending is growth capex, and about one-quarter is maintenance capex. But it's important to say that if they were to only spend at the maintenance capital spending level, it would catch up with them eventually — not for a few years because of their technological lead, but it would catch up with them. I think there's a significant amount of asset purchases that feed and fuel the R&D organization. Even though the company says it's more like one-quarter to three-quarters, I think of it more the other way around. I think they do need to keep spending in order to keep competitors at bay. Sorry, the first part of your question was on competition?

Q: I don't recall — maybe the questioner can send it again. I'll ask another one at this time. How quickly is the Chinese competition moving upmarket? Han's seems to be growing quite fast in the last few years.

A: I think that is similar to the first part of the other question. Han's is definitely a major competitor in China, and they're probably one of the biggest threats out there for IPG. There are a couple of other competitors around the world too. There are two or three public companies in the U.S. that are well behind IPG, but certainly are capitalized and are investing. I think that the industry is getting more competitive and that the two- to four-year competitive lead that IPG has had is going to shrink somewhat. It seems like that at various points in time, and they always seem to innovate faster and manage to maintain that lead, but it does seem to be a little different now, that there are more competitors out there. It looks like the Chinese competitors are getting a lot of support and are having enough success in the marketplace at the low end that they're able to reinvest their profits to move upstream. I think the competition is going to get more and more intense, which is why I've assumed, even in the base case, that IPG is not going to get any further scaling of their margin, and in the downside case that they're going to lose margin. I'm assuming this is going to be a tougher business, but they've always managed to beat that fear historically.

Q: You've answered the earlier question in part — it was about pricing power in light of their high market share.

A: In terms of the pricing component of that, they definitely have suffered a bit in the past six months. We've seen some real signs of pricing erosion. There's a lot of undercutting by the Chinese competition, and that's forced them to take their prices down, especially at the lower end of the market. In the upper third of the market — at the high-power laser range —

they've been able to keep their pricing power, but a lot of capacity was built over the past couple of years both by IPG and the competition, and we're going through a capacity digestion phase right now where you have a bit of a slowdown in the end markets, a bit of fear over the tariffs. That capacity is sitting there and it's not fully absorbed, and now you're starting to see that reflected in price cutting.

IPG claims that a number of Chinese competitors are actually selling well below their cost, and that those companies would go bankrupt pretty quickly if they continue selling at those levels. IPG's strategy therefore is to wait them out — to cut prices as well and maintain market share.
Unfortunately, you don't want to be going up against the Chinese government if that's ultimately what's backstopping those competitors. There have been cycles of this in the past. Their strategy is to continue to innovate, continue to focus on the high end. One of the consequences of the price cutting that's happened at the low end is that the volumes being sold at that end have ramped up pretty dramatically, so while they're getting less margin on that product, everyone is selling a lot more. Because it's so cheap, it's causing penetration and adoption to accelerate. The profit hit hasn't been that bad when you consider the volume and the pricing.

Q: Are there military applications of this, and would this be considered sensitive technology for purposes of export or cross-border M&A?

A: To whatever extent they're involved in highly sensitive areas, they haven't discussed it or been willing to discuss it. That's been asked by us and others, and we haven't gotten a clear picture of what they're doing there. They might have some covert division within the company that's got projects going on there, but it's not been something major that they've focused on as far as we've been able to ascertain. It seems most of their work with the military has been more basic industrial applications, like the paint removal, but you have to imagine that there are weapon systems, communication systems, and other more sensitive areas where they would have a huge role to play. Given the founder's background, being from Russia, you have to wonder what vetting process he would go through and what ability they would have to secure those contracts. I don't really have a good answer for that, but it's definitely a great question.

Q: How do you think about capital allocation going forward? What do you think should be the priorities?

A: I wonder whether they're too conservative and have accumulated too much cash at this point. It's more cash than they've ever held even relative to the size of their business. Given how cheap the stock is, I personally would take a third or half of their cash and maybe put that into stock buybacks. At these levels, it would be highly accretive to earnings. They don't really need that much cash unless they're anticipating a prolonged downturn, but it doesn't seem like that's what they're anticipating or what is most likely to happen. I would like to see their priorities continue to be investing in technology. There's such a long runway of new applications, and IPG is well positioned to be at the forefront of this industry for a long time if they keep spending on R&D. I might even increase the allocation to R&D if there are enough growth applications to go after.

They haven't done acquisitions in the past to much of an extent. They've got a number of tiny tuck-ons, where they might pay $20 million or $50 million or $80 million. They recently bought a company called Genesis. I forget the exact price they paid for it, but it was in that range. It's a traditional welding company that's migrating into higher-technology

applications. The acquisition was done not only to help Genesis go into higher applications and new types of services, but also to learn from their deep experience in traditional welding in order to tailor lasers to be more capable of disintermediating and replacing functions in traditional welding. It was an interesting knowledge-base type of acquisition. They prefer growing organically to making major acquisitions, so I don't think you're going to see them doing that. My big focus right now would be R&D and buybacks.

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About the instructor:

Chris Crawford is the Managing Partner and Chief Investment Officer of Crawford Fund Management, LLC, a Boston-based Investment Partnership. The firm manages a long/short fund that invests in equities and options with an emphasis on underfollowed public companies. Prior to co-founding Crawford Fund Management in 2009, Chris was Managing Director, Portfolio Manager and head of the Boston office with Stark Investments, a $10B multi-strategy global hedge fund. At Stark, Chris built the firm's equity long/short team and managed $1.5B in equity long/short assets as well as a $200M short-biased portfolio. From 2003-2006, Chris was Senior Vice President and Portfolio Manager with Putnam Investments, and co-Portfolio Manager of the $3B Putnam International Capital Opportunities Fund and related client accounts. From 2000 to 2003, Chris was a Partner and Senior Analyst with ABRY Partners on a team managing a $400M TMT-focused hedge fund. From 1996 to 2000, Chris was with Wellington Management Company, where he served as a Global Industry Analyst covering the media industry and as a Portfolio Manager for $600M in client sector-fund and institutional assets. Chris holds an MBA from The Wharton School of Business and graduated magna cum laude from University of Pennsylvania with a BA in Physics, BS in Economics, BAS in Systems Engineering and an MA in International Relations.