

17-Dec-2014

Analog Devices, Inc. (ADI)

Sanford C. Bernstein Technology Innovation Summit

CORPORATE PARTICIPANTS

Vincent T. Roche
President, Chief Executive Officer & Director

OTHER PARTICIPANTS

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

MANAGEMENT DISCUSSION SECTION

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Good morning, everyone. I'm Stacy Rasgon; I cover the U.S. semiconductor space here at Bernstein. And it gives me great pleasure to introduce Vincent Roche, the President and CEO of Analog Devices.

So I think ADI has a reputation for being one of the more respected semiconductor companies out there, it's not one of the most respected. It's got a very high quality franchise, particularly as it relates to signal conversion and processing. I think over the last decade or so the company has embarked on a rationalization program of both their product portfolio, as well as their manufacturing footprint. They were smart enough to exit mobile early enough to actually get paid to do, but they're one of the few to actually get paid to exit that business.

They've increasingly focused their product offering on high-value applications, whatever the end market, as well as greatly increasing their presence in new markets such as automotive and healthcare over the last [ph] few (00:50) years. They took early steps [ph] for what it (00:52) appears to shutter unnecessary capacity; and they recently closed the purchase of Hittite Microwave, which gives them a presence in RF, microwave and millimeter wave technology that greatly complements their existing portfolio.

Overall, this has been a company with steadily improving economics and trough margins that are now higher than their peak margins used to be. I'd say that investment controversies, at least from questions I get from clients, tend to focus right now about how much more margin expansion, if any, could remain in the model; whether the company can really return to sustainable growth and from where that growth might come from; whether the Hittite deal is going to help with that; whether it can drive upside and how long that's going to take to achieve; and whether the renewed focus on cash return is truly sustainable for the long haul.

And so, to answer these and hopefully many other questions, it gives me great pleasure to welcome Vince with us. Vince, thank you so much for being with us here today.

Vincent T. Roche
President, Chief Executive Officer & Director

Thank you, Stacy. Good morning, everybody. How many of you actually know ADI? Oh, great, virtually everybody. So I'll make my introduction very short. So in January, we're going to celebrate our 50th anniversary in business, which I think is remarkable for any corporation in America. I think less than one in 1,000 corporations in America make it to 40 years. So to make it to 50 years is pretty special; and to do so in the tech world, I think, is even more special.

So what has been the underpinning of ADI's not only surviving over 50 years, but actually thriving? I think number one, we are focused on the real world; and as the real world becomes more virtualized, it's a great place for ADI. We play on that bridge between the physical world and the world of the digital across many, many businesses. We're innovation centered as a company. We are developing – we're looking for the toughest problems that our customers are dealing with across many, many different sectors. So diversity is important in terms of customers, applications, geographies.

And we take a very long-term view to how we place our investments. We play in applications, as I said that are very, very difficult fundamentally, where tough problems need to be solved; and where the barriers to entry are high; and where we can get longevity in an application and get very sustainable returns. So that's the basic thesis for ADI.

And as we approach our 50th anniversary, I've been looking at the academic material to understand what underpins corporations in general who tend to survive over the long-term; and I think we share many of the characteristics. Number one, you've got to be very, very sensitive to your environment, you've got to be able to sense that environment and adapt to it at a pace faster than your competition.

And we've done that very, very well over a 50-year period. It isn't very well-known in fact that when we started in business back in 1965, we were actually a module company integrating pieces of discrete transistor technology into modules. And we made the transition from modules into integrated circuits when it was still in the realm of the lunatic fringe. We've got a very strong core value system in the company. As I said, we're innovation-centric. We are a company that praises excellence in everything that we do.

We innovate in every part of our business. It's not just about product development, but in every part of our business. There is a tremendous collaborative spirit across the company as well that allows us to deal with the complexities, the growing complexities, in our business. So we're able to fuse more and more capability from across the company to solve the more meaningful and bigger challenges as they arise.

And also, we've been financially conservatively managed. That's one of the underpinnings of the company; and we have always tried to maintain a very strong cash balance. And it's a virtuous cycle, the more we grow, the more profitable we become, the more we're able to invest in our business.

So that's pretty much it. I think in this world everybody talks about the Internet of Things upon us, but really what that is, is a lot of the stuff that we've been doing for the last 50 years. It's about sensing, it's about converting and connecting high-quality bits from the real world into the world of the digital. So that's going to be a more meaningful place, I believe, in the years ahead for ADI in terms of the amount of opportunity that we can develop for the core technologies that we have and that we've got in such depth.

So with that, I'll be glad to work with Stacy here to take any questions that you might have.

QUESTION AND ANSWER SECTION

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

Thank you. Why don't you get settled? So we will open this up at the end for audience Q&A, if anybody does have questions, so you'll have your chance. Vince, I wanted to start probably with the Hittite deal, because that's probably top of mind for many of my clients right now.

Vincent T. Roche
President, Chief Executive Officer & Director

A

Yeah.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

Can you just give us a brief overview of what the rationale was for Hittite? What was it about them that made them attractive? Why did you go after it and how did you make that determination?

Vincent T. Roche
President, Chief Executive Officer & Director

A

Yeah. So, Stacy, in this world of hyper connectivity, particularly mobile hyper connectivity, the need for radio frequency technology is growing at an exponential rate. And as a company, we have been playing in the areas of communications infrastructure technology from 1G right to 4G, and now we're plotting 5G technologies. All those particular applications we've centered ourselves in the radio in those applications; and there is a need to be able to integrate and work with our customers more across the radio subsystem.

So, as a company, we've got tremendous strength in the mixed signal domain. And we've been moving organically as well into the radio frequency and the millimeter and microwave technology areas. So it was a very natural thing to do in terms of building a franchise. We had a \$200 million plus franchise in that space prior to Hittite. Now we've got a \$0.5 billion pillar when we combined Hittite with ADI. To a lowest attack to attack the opportunities in communications infrastructure, in areas like instrumentation, in automotive, more and more very high frequency, gigahertz radio technologies are being used in advanced driver assistance, for example.

So we got a lot more capability to bring to bear and we're able to work with our customers as well more now at architecture level rather than selling the parts. We've got the strength of ADI's mixed signal technology that's working done at the bit level with the strength of Hittite right up to 100 gigahertz plus. So there are many different types of problems we can solve. And an area that we hadn't got the strength of Hittite in terms of market coverage was aerospace and defense. We're solving a lot of new problems in that area now.

So I think culturally, it made a lot of sense. We're both engineering-centric cultures. And also, I think the geographic proximity just reduced the complexity of the integration process a lot. 70% of the resource of Hittite is here in the playground of ADI in Massachusetts here.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

Got it, got it. And you've talked a little bit about sort of initial customer reaction.

Vincent T. Roche
President, Chief Executive Officer & Director

A

Yeah.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

I guess you've been extremely bullish about the initial customer reaction. Can you give us a view of what customers are saying? What is it about the deal that customers are liking and how are they actually changing their engagement for both you and the Hittite side of things?

Vincent T. Roche
President, Chief Executive Officer & Director

A

Yeah. Good question, Stacy. So, essentially, when we took Hittite on board, they have incidentally more than 1,000 products SKUs in their portfolio. So ADI has a sales force that is 20 times bigger than what Hittite's was.

So initially the thought was that we would combine the pieces of the two companies and automatically ADI brings another 1,000 key products in a key technology area to the market through our channel, direct channel, distribution channel. And I can give you some anonymous testimonials from customers.

One of our top industrial customers in the instrumentation area has told us that what the combination of the two pieces brings them now is, instead of talking about converters and RF in terms of the sockets, we're now talking about how they architect their frequency plan across the huge range of frequencies that they've got to cover in their particular application.

In the point-to-point area, for example, in communications infrastructure, again we're able to architect solutions for multiple generations from here, right, and allow our customers to really think in a creative way about using one key source at a system thinking level for the next point-to-point systems that are going to be very important for the backhaul in communications infrastructure.

So I'd say overall the response has been very, very positive. I think as well the fact that ADI is able to bring – one of the hallmarks of our franchise is that we have more than 20,000 product SKUs that we're able to ship to 80 countries with extremely agile supply chain capability with one part for million quality levels. So I think the confidence in being able to use Hittite as part of ADI growth. So part of its technology and part of it is the operating side of the value proposition that we bring.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

Got it. So I guess with those advantages and with the increased channel [ph] reads (11:52) you have, are you bringing new customers into the Hittite fold in this case or are you able to sell more effectively to existing Hittite customers or is it a combination of both?

Vincent T. Roche
President, Chief Executive Officer & Director

A

I think both, Stacy. We're able to do both. With Hittite's reduced – Hittite hasn't got a big distribution channel. Depending on when you measure, ADI has about 70,000 customers to 100,000 customers [ph] for prior (12:16) products per year. Hittite had a fraction of that. So we bring an enormous amount of coverage, both in the [ph]

direction and the indirection (12:25), but also Hittite has brought some new customers to us, particularly in areas like aerospace and defense where we hadn't got great heft, particularly in the RF and microwave area.

Stacy Aaron Rasgon

Sanford C. Bernstein & Co. LLC

Q

Got it, got it. So if these are new customers, how long does it actually take to drive revenue? I mean, obviously you have a very long – typically long design life.

Vincent T. Roche

President, Chief Executive Officer & Director

A

Yeah.

Stacy Aaron Rasgon

Sanford C. Bernstein & Co. LLC

Q

And that's good because if demand is sticky ...

Vincent T. Roche

President, Chief Executive Officer & Director

A

Yeah.

Stacy Aaron Rasgon

Sanford C. Bernstein & Co. LLC

Q

...once it gets here, but it does take some time...

Vincent T. Roche

President, Chief Executive Officer & Director

A

Yeah.

Stacy Aaron Rasgon

Sanford C. Bernstein & Co. LLC

Q

...to get revenue. When can investors start to expect to see some revenue upside or revenue synergies from the deal?

Vincent T. Roche

President, Chief Executive Officer & Director

A

Well, I'd tell you, first off, we've been very impressed – as we mentioned on our earnings call there a few weeks ago, we've been very impressed with the demand rates that we inherited from Hittite. I think in terms of creating new business – and the core reason for doing this deal essentially was revenue synergy, growth synergy.

Stacy Aaron Rasgon

Sanford C. Bernstein & Co. LLC

Q

But there were no revenue synergies in the model that you've presented?

Vincent T. Roche

President, Chief Executive Officer & Director

A

That's correct. But we've been very, very clear with our investors that you can expect to see the revenue synergies begin, I think, around the end of 2015.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

Okay.

Vincent T. Roche
President, Chief Executive Officer & Director

A

So our 2015 ends in October, our fiscal year. So a run then I think with the pipeline of opportunity that we have and the thinking was that Hittite was working on, we'll start to see the revenue synergies starting 2015; and I think 2016 is when we will start to see a meaningful contribution in terms of the multiplication factor of Hittite with ADI.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

Got it, got it. Do you think there is more of a play here in terms of inorganic growth for ADI than we've seen in the past? I know, as Dave has talked about keeping some of the powder dry in terms of the cash balances to be free to do more acquisitions. You have long-term targets that to me would imply you probably need inorganic growth in order to read some of those. What are your thoughts in general I think on – and we see more consolidation in general in the industry.

Vincent T. Roche
President, Chief Executive Officer & Director

A

Yeah.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

What are your thoughts in consolidation of the industry and is that a [ph] bigger labor (14:20) do you think more important for ADI than maybe it has been in the past?

Vincent T. Roche
President, Chief Executive Officer & Director

A

Well, let me give you a sense for how we think about growth overall. We've put out some new targets at our Analyst Day back in June of this year. I think between the combination of Hittite and ADI, we said that we think we can grow this business at two times to three times GDP. So that's somewhere in the region of 6% to 9% a year.

My sense is on a compounded basis, notwithstanding the cyclicalities in our industry, but over time I think we can achieve at least the midpoint of those growth projections and possibly on the higher end depending on how well the acquisition of Hittite actually plays out.

So I think we'll have a good growth story in terms of the combination of ADI and Hittite. Something else I think that isn't probably as well understood or we haven't conveyed as well as we could have is that what we call our core business inside ADI, the B2B, the non-consumer part of our business. That has grown between 8% and 10% compounded over the past five years.

What has dampened our topline has been [ph] what you call (15;31) from the consumer space; and I don't think that's as well understood as it could be. But I think we've got the headwinds now on the consumer side largely behind us.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

But how much of your revenue is, say, the consumer piece four years or five years ago, and how much is it today?

Vincent T. Roche
President, Chief Executive Officer & Director

A

Well, we were investing 40% of our revenue six years or seven years ago in – 40% in R&D in the consumer space.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

That's high.

Vincent T. Roche
President, Chief Executive Officer & Director

A

40% of our total R&D in the consumer space.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

It was that high then, wow.

Vincent T. Roche
President, Chief Executive Officer & Director

A

It was that high. Well, remember we were in mobile chipsets as you pointed out.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

Yeah.

Vincent T. Roche
President, Chief Executive Officer & Director

A

We were in the PC power, PC audio...

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

Yeah.

Vincent T. Roche
President, Chief Executive Officer & Director

A

...a lot of portable applications. We were in digital cameras in a big way. So I think that the move out of there was very conscious. And so, the revenue was also around 35%, 40% of the total at that point in time. It's now more like 10%. And I think we're addressing applications in the consumer areas where we make a demonstrable difference

to the user experience, as we're seeing across the more infrastructure oriented part of the consumer, as well as the portable part of the consumer...

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

Can you give us an example of the [ph] the, say, (16:44) value-add in consumer and something you can get paid for to do in that space?

Vincent T. Roche
President, Chief Executive Officer & Director

A

Well, for example, if you take these mobile devices that everybody is using and you take the camera application in there, trying to get a good quality imaging for something so tiny requires an awful lot of control electronics, right, to be able to control motion, for example. So we supply a very, very sophisticated motion, optical image stabilization system, for example, in these things with good ASPs, good margins, because it's a very difficult problem to solve. You've got a tiny physical space to get a good image produced; and that's one example of how we apply our precision portfolio for that problem.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

Got it.

Vincent T. Roche
President, Chief Executive Officer & Director

A

Now in terms of the acquisition side of things you mentioned as well.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

Yeah.

Vincent T. Roche
President, Chief Executive Officer & Director

A

To me I think it's important to be able to keep a cash flow to make sure that no matter what cataclysm would hit our industry, we could invest in our business for the long-term.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

Not that you're calling for a cataclysm?

Vincent T. Roche
President, Chief Executive Officer & Director

A

We're certainly not calling for a cataclysm. I think there is – that's doomsday, right? But I think – so we've always kept a conservative approach to keeping a certain amount in the bank. So that will always be the case.

And in terms of future activity on the M&A side, we now at least have a dialogue inside the company about what the possibilities are, like we did in a way that produced the Hittite idea. But I think number one, Stacy, we've got

to make sure that we make Hittite a success in ADI and then we can start thinking about the next thing, whatever that next thing might be.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

Got it. And so, what metrics should investors be looking forward to get comfortable that Hittite is in fact a success, is it growth, is it margins?

Vincent T. Roche
President, Chief Executive Officer & Director

A

I think it is primarily growth. You see, I think the way to look at this, if we get the growth, we've got – the margins are very inherent...

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

Yeah.

Vincent T. Roche
President, Chief Executive Officer & Director

A

...in that business, as you know, when Hittite had been running an average of 70% gross margins. And we think there is potentially even some upside on the margin exit rate of Hittite, just given the greater buying power that we can bring, from materials, to process technologies, to packaging, and test, and so and so forth. So I feel good that we've got a good margin story. So it really is about getting the growth. And I think in those radio frequency technologies in the areas in which we're playing, we can hit the higher end of the growth model. That's my sense.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

Okay. We'll be watching for that. I think as we're talking about businesses that you're in, businesses that you're exiting, businesses that you're buying, in general how does ADI think about prioritizing the investments in the different product spaces that you're in? I had a conversation with your predecessor, with Jerry once upon a time. I was at a lunch with investors and somebody asked him to talk about linear tech and somebody asked him, would you reject business, it doesn't mean your margin target...

Vincent T. Roche
President, Chief Executive Officer & Director

A

Yeah.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

And Jerry kind of looked at him and he said, that's the stupidest thing I've ever heard. If any of you know Jerry, you can...

Vincent T. Roche
President, Chief Executive Officer & Director

A

Well, Jerry is impressive.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

Yeah. And he said when you win, when you get a [ph] socket (20:00) you always take the business, always, no matter what, because you've already made the investment.

Vincent T. Roche
President, Chief Executive Officer & Director

A

Yeah.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

So the right question is what investments do you want to be in? [indiscernible] (20:07)...

Vincent T. Roche
President, Chief Executive Officer & Director

A

Yeah.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

...what investments do you – what areas do you want to be in and how do you make that decision?

Vincent T. Roche
President, Chief Executive Officer & Director

A

Yeah. So to answer the – partly what Jerry had said to you several years ago, we often have discussions about it, is it growth, is it profit? Things are on the margin, so to speak; no pun intended. We go for growth. So I think it's more about the markets in which you play, the quality of the innovation. If you're bringing great products to market, in the right markets, the margins are inherent.

So we are, number one, playing into the B2B space. So we've really re-tooled the company. When I talk with B2B, I mean the industrial area and all of the applications. And that's largely a business that requires a lot of standard products with a very sophisticated go-to-market channel.

And communications infrastructure and automotive are a bit more application-specific product investment, but the margins tend to be good. Automotive is not quite as brisk I'd say in terms of margin as communications infrastructure.

[indiscernible] (21:13) I think the healthcare business is something we've been investing very modestly in for the past five years or seven years; and we're beginning to see the fruits of our labors there now with very pretty targeted products for things like vital signs monitoring, and glucose monitoring, for example, where a very reliable measurement is required, be it for vital signs on the human body or glucose monitoring or whatever. So I think it's more about, we pushed the innovation curve, we make sure we're first to market which whatever modality we're playing in. And those markets are inherently more margin rich and less pressured than, say, some of the consumer applications.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

I find your comments on healthcare interesting. So I heard a similar tone from you on automotive, say, four years or five years ago and it was – you had lumped it into industrial, but it was too small to break out. Now auto is, what, 20% of your revenue [indiscernible] (22:08), right...

Vincent T. Roche

President, Chief Executive Officer & Director

A

It's about 20%, yeah.

Stacy Aaron Rasgon

Sanford C. Bernstein & Co. LLC

Q

...that you've broken out. Are we at a similar stage do you think right now for healthcare? Is that something where three years, four years, five years down the line that could be sizable enough for you to start breaking out specifically?

Vincent T. Roche

President, Chief Executive Officer & Director

A

Yeah. I think it could. It's about 7% of our revenue today...

Stacy Aaron Rasgon

Sanford C. Bernstein & Co. LLC

Q

It's that high?

Vincent T. Roche

President, Chief Executive Officer & Director

A

It's about 7% of our revenue.

Stacy Aaron Rasgon

Sanford C. Bernstein & Co. LLC

Q

Did you lump it into industrial currently?

Vincent T. Roche

President, Chief Executive Officer & Director

A

We lump it into industrial.

Stacy Aaron Rasgon

Sanford C. Bernstein & Co. LLC

Q

Okay.

Vincent T. Roche

President, Chief Executive Officer & Director

A

Yeah. So the two pieces are roughly half the company's total revenue. And healthcare is one of those things where it's probably the one space where all the things we build are most needed, but where ultimately the customers who buy this stuff can't afford it. There's a lot of debt structures in the healthcare system. But we're seeing I think a tremendous evolution now of technology outside of the big iron type applications, the CT scanners where we sell a lot of imaging...

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

Yeah.

Vincent T. Roche
President, Chief Executive Officer & Director

A

...conversion products. A lot of our products now are getting used in reliable vital signs monitoring for – and I think these things will change the way healthcare is delivered. We're working with some of the bigger system players in that business who understand the clinical environment very, very well. And it's my sense that over the next three years to five years to seven years we're going to see an uptick. And we've brought a focus to that business by really thinking about the system problem, not just selling bags of components, but thinking about the underlying system problems that our customers are trying to solve.

We've also been extending our available market there, not only in vital signs monitoring, but also in bringing Photonics, for example, Photonics sensing technology, combined with our converters that change the quality of the solution, the completeness of the solution that we're delivering and ultimately the ASP of that solution. So I'm very bullish about it. I think it's a modest investment as a part of our overall R&D, but an area with a tremendous amount of upside.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

You're clarifying your comments on sort of focusing on the system problem; interesting. It's probably a good segue into IoT. That's one of my bigger issues with IoT, because I'm not sure enough thought yet has been going in there. If you want to [ph] call the (24:20) systems probably with the use cases or the – what's the problem I'm actually trying to solve with this device rather than saying, I have a device, what can I do with it? What are your thoughts in general, I guess, on how the industry now – the industry now is approaching to the idea of the Internet of Things or the idea of wearables?

Vincent T. Roche
President, Chief Executive Officer & Director

A

Yeah.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

What is ADI doing that's different? I know, obviously, you've been playing in similar types of markets...

Vincent T. Roche
President, Chief Executive Officer & Director

A

Right, right.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

...for many, many years, but what are your thoughts on that?

Vincent T. Roche
President, Chief Executive Officer & Director

A

Well, when you talk about the Internet of Things, I think everybody has a different definition of what it actually is, but it all remains...

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

It can mean anything you want it to mean, right?

Vincent T. Roche
President, Chief Executive Officer & Director

A

Whatever you want it to be. And I think for us, we actually in a recent restructuring of the company where we combined our technologies and our market operations in a more cohesive way, we have set up an IoT team. And we have said, look, follow the [ph] Ethers (25:14) of the company, find the applications where we can get high barriers to entry, long product lifecycles, and then use the blocks that we already have as a company.

You ask yourself, why is everybody talking about the IoT now? And I think it's largely because the pervasiveness of cheap computing power and connectivity, mass connectivity, in a mobile way is available. But the underlying problems in terms of how you bring the real world into that cloud and into that big data stream, those problems are – many of them very, very tough.

So, for example, in the industrial space, we have a very strong business in plant automation and our customers are asking us to bring sensor technologies to allow them, for example, to monitor machine to do predictive analytics. And I think that in many ways is going to be what drives a lot of the application build-out in this Internet of things. But there are many, many places that you can play today that I think are unattractive – will be very, very high volume, unattractive.

So we will apply the business model that will serve the company very, very well for many years to pull out those applications where we need to do more focused engagement in the healthcare space, in the industrial automation space. We'll also benefit incidentally, I think, as more and more high-quality information that we brought from the real world into the cloud and into the big data stream, a lot of it's going to move in a very mobile way. It will move in a wireless way, I should say, and that's good for our infrastructure business. So I think that's how to think about it, Stacy, for us. It's really what is IoT in terms of what ADI will do? It's about sensing, it's about signal processing and connectivity, communication. That's how we view it.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

I guess your connectivity portfolio that right now may be – one might classify it as a little less robust. Is it possible, do you think, to drive success in that business without all of the different radio technologies that might be needed to bring that data from the Edge to the cloud?

Vincent T. Roche
President, Chief Executive Officer & Director

A

Yeah. Well, again, it will happen in different ways. We don't necessarily have to move that data into the Ether or into the cloud, so to speak. Our challenge is to get high-quality bits, a representation of the real world into a host PC or a host processing device and very often the communications is done elsewhere. So there is a connectivity factor, no matter what we do. We are developing some very short-range technologies. We already have products that we've been selling into the energy sector where we do high-quality robust communication of energy

information, for example, energy consumption and efficiency information. So we have a heritage in at least the B2B space in moving high-quality data through the air.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

Right. Does this mean that – do you see more of I guess the analytics happening locally at the Edge though or in the data center. And I could argue the way – I mean I could imagine there are certain cases maybe in a large scale industrial plant or a NewCo plant where you might not want the damn thing connected to the Internet?

Vincent T. Roche
President, Chief Executive Officer & Director

A

That's right. I think, first and foremost, unless we can all convince ourselves that data can be securely generated and moved, the Internet of things won't happen. Our industrial customers are working very, very hard to making sure that the security of data is [ph] permanent (28:52). Car companies, where there is going to be a lot of data, base stations are moving into cars, there's going to be a lot of data moving around the cloud, that data is very, very secured as well. It can't be hacked.

And there's an ongoing debate – and our technologists can give you a much more in-depth description than I, but there is an ongoing debate around how you architect the processing gain, do you put more of it down at the sensor, do you put more of it into the host, so to speak. I think it will depend very much on the application. But we're capable of providing – we use a lot of microcontrollers, we use a lot of DSPs in our business. So whatever the architecture, at least we have the capabilities to move the processing to the sensor or provide the data streams to move the processing elsewhere.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

Got it. And on that theme of security, is that something that ADI is able to supply or are you partnering with others who can supply that security?

Vincent T. Roche
President, Chief Executive Officer & Director

A

Yeah. I think that's going to be a partnering activity pretty much, yeah.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

Okay.

Vincent T. Roche
President, Chief Executive Officer & Director

A

Yeah. We have already some devices we produced, by the way, some processor devices where we build security capability into them. And I think that's going to be – for the entire industry, not just for ADI, that will become a bigger and bigger challenge, security in general, as data moves more freely and across boundaries.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

Yeah. We're seeing some of that.

Vincent T. Roche
President, Chief Executive Officer & Director

A

And we're seeing, right?

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

Yeah. I want to switch a little bit. I want to talk about automotive. So again automotive has been a very good story for you.

Vincent T. Roche
President, Chief Executive Officer & Director

A

Yeah.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

It's grown tremendously and offset some of the other, the fair bit of consumer shortfalls that we've got, presumably better margins. I am a firm believer in general on the content story, the content, because we've done some work on that. Can you give us your own views I guess on maybe in general how you see content increase in automotive driving growth? How much above, say, overall semis or maybe even above auto unit growth [indiscernible] (30:46)? And which of the specific electronic subsystems do you think drive most growth in autos in general? And specifically for ADI, which ones are most attractive for you?

Vincent T. Roche
President, Chief Executive Officer & Director

A

Yeah. Good question. So if you take the higher level question about growth, over a five-year period that business really has grown 20% compounded, 8% in the three-year period. The denominator is getting bigger, so growth is a little harder to get. But it's a \$0.5 billion business for ADI now, a little over \$0.5 billion. And there is going to be – we have more and more of our conversations now with the actual OEMs, with the car companies, particularly the ones who are viewing technology. And they're all becoming IT companies in some way now, but the ones who are using aggressive adoption of semiconductor technology. What we're being told is that cars in five years, six years time will be using more than 20 billion sensors a year. So there's a tremendous opportunity.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

20 billion sensors on 80 million TAM?

Vincent T. Roche
President, Chief Executive Officer & Director

A

Across the entire – a little bit more – there will be more growth in car units. And a lot – today, there are hundreds – by the way, there are 6,000 to 8,000 semiconductors used in cars today and all those in some way are pulling data from the powertrain or from the [indiscernible] (32:13) or whatever. So I think there will be – whether it's 20 billion – there is going to be a lot of sensors used.

And for us, we break our business into three chunks. We have the safety part, which is – and we're one of the only companies that has been investing to be able to play in the passive, the active and the predictive safety. I think in that space, our MEMS business has been kind of the stable driver of that business over many, many years.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

That's airbag sensors or gyros?

Vincent T. Roche
President, Chief Executive Officer & Director

A

Airbag sensors, gyros, for rollover detection, for example. So that's becoming more and more mandated. What we're seeing in terms if it's still a relatively small part of that safety business, but what we're seeing is the radar application, the Advanced Driver Assistance is becoming – that is now the fastest-growing part of the actual safety business; and that requires a lot of microwave and radio frequency and mixed-signal processing technology. And that's got a long way to go in terms of broad adoption across the market. So I think that will be a very good application.

The powertrain; in general, the powertrain is being electrified and there's a lot of sensing and control needed there. We've got a strong position in the idle start/stop battery application, so a good share there. We're gaining share in the hybrid and electric vehicle area as well. And also when I talk about sensors, there's oil quality sensing, fuel quality sensing. Those things now are beginning to become more pervasive in the car.

Infotainment, we just announced – a couple of weeks ago, we announced a new bus structure for moving media around the car. There's a very real problem to be solved in terms of taking weight of the car by taking out wiring harnesses and increasing the quality of the sound, and the vision, and the images that are used in cars.

So we've built – we're doing a lot of multimedia interface devices. There is new bus structure for audio noise cancellation, for example. So there's a long way to go I think in terms of the adoption of more sensing technologies and just improving the driver experience and the efficiency of the car, and the electrification of anything that is today mechanical and trying to move it into the electrical domain.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

Got it. So if you think car units are going to grow whatever the number is 2%, 3%, 4% a year, where do you think semiconductor revenue can grow on top of that? Let's ignore fluctuations in inventory. If it's normalized growth, where do you think it is?

Vincent T. Roche
President, Chief Executive Officer & Director

A

Well, it's a guess. But it has been – I mean for us it's been five times.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

Yeah. So there's been share gain presumably on top of the electrification in the automotive as well, right?

Vincent T. Roche
President, Chief Executive Officer & Director

A

That's right. That's right. I think the statistics would tell you that depending on what type of business you're in that the semi-content has been growing at twice to three times the rate of car unit growth. I think if [indiscernible]

(35:25) at twice the rate of car growth, that will be a good outcome. So that's my sense. It would be somewhere in the region of 8% to 12%.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

Got it. How much of this [indiscernible] (35:37) grow for you last year?

Vincent T. Roche
President, Chief Executive Officer & Director

A

It was in the low-single digits.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

In this year? 2015?

Vincent T. Roche
President, Chief Executive Officer & Director

A

15%

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

15%.

Vincent T. Roche
President, Chief Executive Officer & Director

A

It will probably be in the low-single digits as well.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

Okay.

Vincent T. Roche
President, Chief Executive Officer & Director

A

Yeah.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

Yeah. Got it. Okay. So that's – okay. So...

Vincent T. Roche
President, Chief Executive Officer & Director

A

I would say maybe 2015 medium-size single digits.

Q

Yeah.

Vincent T. Roche
President, Chief Executive Officer & Director

A

I think it will be single digits.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

One of the concerns I get from clients in general right now was what sort of the trajectory of auto units next year, given auto in general [indiscernible] (36:03).

Vincent T. Roche
President, Chief Executive Officer & Director

A

Yeah.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

And I get same concerns by the way for communication infrastructure.

Vincent T. Roche
President, Chief Executive Officer & Director

A

Yeah.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

We had Texas Instruments here yesterday who said – I think it was Texas Instruments, [indiscernible] (36:12) so many companies yesterday. Well, they said, look, like comm infrastructure is lumpy, right, at some point, it's going to rollover. We don't know was it at the first half, is it end of next year, is it 2016, we don't know. What are your views – I think when we spoke in May ...

Vincent T. Roche
President, Chief Executive Officer & Director

A

Yeah.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

...you'd kind of given a view that you felt like comm infrastructure for ADI was probably like a multi-year...

Vincent T. Roche
President, Chief Executive Officer & Director

A

Yeah.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

...kind of growth.

Vincent T. Roche
President, Chief Executive Officer & Director

A

Yeah.

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

You didn't see any, like, broad fluctuations. Can we still hold to that?

Vincent T. Roche
President, Chief Executive Officer & Director

A

Stacy, the market drives itself crazy...

Stacy Aaron Rasgon
Sanford C. Bernstein & Co. LLC

Q

Yeah.

Vincent T. Roche
President, Chief Executive Officer & Director

A

...in trying to figure out what cycles in what year. The way you've got to look at infrastructure, again, that's a business that last year for ADI grew – the wireless part of that grew well over 20% last year. I'd be thrilled if it could grow 20% this year, I don't know. I think you've got to look at the role that the infrastructure technology is playing in the modern day economy and take a long-term view.

We're investing for the very long-term, we're building the process technologies, the circuit technologies, the system technologies, the customer engagements. It will be a phenomenal business over the long-term. Exactly what happens this quarter or next quarter, very, very hard to read, because it is a lumpy business.

But when you take forward – just take 4G. The penetration of 4G in terms of subscriptions today globally is about 4% or 5% of the total. That will grow to 20%, 30% conceivably in the next few years. Today 4G is consuming about 30% of all the bandwidth in the networks and it's only in its infancy. So it's got a long, long, long trajectory I think in terms of growth and penetration. So I think it will be a great market for the long term.

Vincent T. Roche
President, Chief Executive Officer & Director

A

Got it. What is the, I guess, the outlook and benefit of your DSP business? So it's relatively small, smaller than it used to be.

Vincent T. Roche
President, Chief Executive Officer & Director

A

Yeah.

Vincent T. Roche

President, Chief Executive Officer & Director

A

I think the investment levels David told me once the investment levels there are higher obviously than the rest of the business, you have to do tools development and everything. Why is that a business that you need to be in? What benefits does it drive for, I guess, for ADI's overall portfolio and long-term growth?

Vincent T. Roche

President, Chief Executive Officer & Director

A

Well, I think number one, DSP is one of the most pervasive technologies used in the analog business today. I mean, all these handsets are using very complex DSPs. Cars are using very complex DSPs. So the way we treat our DSP business inside the company today, it's not so much about building lots of products and derivatives for a big catalog. It's about targeting the technology at critical applications.

We still provide standalone DSP products for example for infotainment in cars, but also we use that digital signal processing technology and the knowhow and the algorithmic technology in some of our communications infrastructure [indiscernible] (39:13), where the DSP technology is embedded in the overall mixed signal design. So it's a very important technology and we still have a sizable business in DSP, highly profitable in areas like medicine, industrial, infrastructure and we'll continue to support those applications. But more and more of what we're doing is application specific in the DSP area. I think that's the way to look at it.

Stacy Aaron Rasgon

Sanford C. Bernstein & Co. LLC

Q

Got it. Got it. If we talk a little bit about how you're managing the business in general, I think the metrics, maybe [indiscernible] (39:48) year-over-year revenue growth and operating profit.

Vincent T. Roche

President, Chief Executive Officer & Director

A

Yeah.

Stacy Aaron Rasgon

Sanford C. Bernstein & Co. LLC

Q

I know you've talked in past about potentially making some changes to those metrics. Where are you now on that and how are you actually managing the company and the business?

Vincent T. Roche

President, Chief Executive Officer & Director

A

Yeah. So what do we care about? We care about revenue growth. So that's the business units are measured on the revenue growth, they're measured on overall profitability and also return on investment for new product development. So they're really the three similar metrics and obviously the manufacturing group is looking at the quality and the supply chain, the costs, the margins sold. But in terms of business unit, it really is about the opportunities there. We've got to get the growth. If we get the growth in the markets that we targeted, we'll get the underlying profitability. And new product growth waves are the fuel for a business. So we measure ROI on new products.

Stacy Aaron Rasgon

Sanford C. Bernstein & Co. LLC

Q

How does the reorganization that you just did feed into all of this? What changes did you make?

Vincent T. Roche

President, Chief Executive Officer & Director

A

Well, look, we're always – about five years ago we organized the business units essentially around a matrix structure, which was market segment. And why did we do that? We did that because it brought us closer to markets. We got good insights into the markets in which we're playing. And we were able to aggregate the pieces of ADI for customers in a more meaningful way.

And then the technology teams are focused on advanced technology development, product development, algorithm development and so on, but we decided that there are always ways to optimize your performance, your execution. So recently, we restructured the organization and we still are market focused, we've kept our market focus structure in place, we've aligned the key technologies into business units...

Stacy Aaron Rasgon

Sanford C. Bernstein & Co. LLC

Q

Okay.

Vincent T. Roche

President, Chief Executive Officer & Director

A

...with those market segments. So for example, the very high-speed technologies tend to be used in primarily in communications applications in some very high-end industrial applications. So we've aligned that technology development unit with the communications infrastructure business.

So, look, it's really about speeding everything up. Can we link strategy and execution better together to improve the outcome, to make sure that we make decisions fast, that we execute faster and that the accountability is very, very accurate.

Stacy Aaron Rasgon

Sanford C. Bernstein & Co. LLC

Q

Was that a problem before I know in a matrix organization, sometimes it's hard to pin.

Vincent T. Roche

President, Chief Executive Officer & Director

A

There are always matrices. Look, we have a centralized sales force, we have a centralized manufacturing operation. We have had for 20 years, that's a matrix. I think companies as complex as ADI, you've always got some form of matrix in place. But, what you've always got to try to do I think is find ways to have organizations solve some of the engineering problems with complexity.

And I think what we're doing by combining the market and technology operations together, we're reducing the complexity as much as we can, in terms of decision-making, ownership and speed is a great competitive weapon.

Stacy Aaron Rasgon

Sanford C. Bernstein & Co. LLC

Q

Yeah.

Vincent T. Roche

President, Chief Executive Officer & Director

A

Are we learning faster than our competitors, are we executing faster than our competitors. We are, we win. I think that's the way to look at it.

Stacy Aaron Rasgon

Sanford C. Bernstein & Co. LLC

Q

Got it, got it. We've got a couple of minutes, maybe two, if there – are there any questions from the audience? I want to reach out and see. Nothing, no. Okay.

Vincent T. Roche

President, Chief Executive Officer & Director

A

One down, here we go.

Stacy Aaron Rasgon

Sanford C. Bernstein & Co. LLC

Q

[ph] Jordan (43:23)

Q

[Inaudible] (43:22-43:52)

Vincent T. Roche

President, Chief Executive Officer & Director

A

Yeah. Look, we did our earnings release there about a month ago. And we said – I said at the time I think as long as the macro economy doesn't come un-glued, it will be a good – it will be a growth year. And that's what I believe, if the macro economy doesn't come un-glued, we'll have another decent growth year, I think.

Stacy Aaron Rasgon

Sanford C. Bernstein & Co. LLC

Q

Okay. I'll give you a 30 seconds soapbox. Why should investors buy your stock?

Vincent T. Roche

President, Chief Executive Officer & Director

A

Well, look, I think ADI, as I said, has been in business 50 years, we'll be in business another 50 years. We generate – we're in the top 1% of companies in the semiconductor world, which by the way is the foundation of the modern technology economy. We play a critical role in the connection of the physical world and the digital world. And I think the culture that we have of driving for innovation, excellence in everything we do, customer passion, and the potential demand for our products in future will make this a great business for many, many decades to come.

Stacy Aaron Rasgon

Sanford C. Bernstein & Co. LLC

Got it. Thank you very much. Thank you for joining us today. Appreciate it.

Vincent T. Roche

President, Chief Executive Officer & Director

Thank you, Stacy. Thank you.

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