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EDITED TRANSCRIPT

ADI - Q4 2018 Analog Devices Inc Earnings Call

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OVERVIEW:

Co. reported 4Q18 revenues of approx. $1.6b and non-GAAP diluted EPS of $1.55.

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PRESENTATION

Operator

Good morning, and welcome to Analog Devices Fourth Quarter and Fiscal Year 2018 Earnings Conference Call, which is being audio webcast via telephone and over the web. I'd like to now introduce your host for today's call, Mr. Michael Lucarelli, Director of Investor Relations. Sir, the floor is yours.

Michael C. Lucarelli - *Analog Devices, Inc. - Director of IR*

Thank you, Jennifer, and good morning, everybody. Thanks for joining our fourth quarter and fiscal 2018 conference call. With me on the call today are ADI's CEO, Vincent Roche; and ADI's CFO, Prashanth Mahendra-Rajah. For anyone who missed the release, you can find it and relating financial schedules at investor.analog.com.

Now on to the disclosures. The information we're about to discuss, including our objectives and outlook, include forward-looking statements. Actual results may differ materially from these forward-looking statements as a result of various factors, including those discussed in our earnings release and in our most recent 10-Q. These forward-looking statements reflect our opinion as of the date of this call. We undertake no obligation to update these forward-looking statements in light of new information or future events. Today's commentary about ADI's fourth quarter and fiscal '18 financial results will be detailed further in our 10-K, which we expect to file next week. Our comments today about ADI's fourth quarter and fiscal 2018 financial results and short-term outlook will also include non-GAAP financial measures, which exclude special items. When comparing our results to historical performance, special items are also excluded from the prior quarter and year-over-year results. Reconciliations of these non-GAAP measures to their most directly comparable GAAP measures and additional information about our non-GAAP measures are included in today's earnings release and on our web schedules, which we posted on the quarterly results section at investor.analog.com.

Okay. With that, I'll turn it over to ADI CEO, Vincent Roche. Vince?

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Vincent T. Roche - *Analog Devices, Inc. - President, CEO & Director*

Thank you, Mike, and good morning, everyone. Well, I'm very pleased to report that ADI had another excellent quarter to cap off what was an exceptional year for the company. We once again hit a high watermark by achieving record revenue of $1.6 billion in the fourth quarter. In addition, we expanded operating margins to 43% and delivered $1.55 of diluted earnings per share.

Looking at the full year now, revenues surpassed $6 billion for the first time. Growth was led by our B2B markets that increased well into the double-digits year-over-year. Diluted earnings per share increased more than 20% year-over-year, and most notably, we generated over $2 billion of free cash flow.

This robust cash generation enabled us to continue investing in the future of our business, rapidly reduced our debt by over $1.5 billion during the year and returned cash to our shareholders. As we outlined on the last call, going forward, we plan to return 100% of our free cash flow after debt repayments. In fact, we've returned $10 billion to our shareholders since 2005 through dividends and share repurchases.

Beyond being a strong year financially, it was also a year of exceptional business progress for ADI, also. So I'd like to spend a little time describing our progress in 2018 and show how specifically it positions ADI for continued strength in 2019 and, indeed, beyond.

Firstly, we made tremendous progress in the integration of LTC using our best-of-both approach. Employees across the entire organization are unified and working towards a common goal of delivering long-term profitable growth. Our R&D teams have synergized product roadmaps and development activities, and are busily extending the cutting edge of analog, mixed signal, power and sensors to deliver impactful solutions to our customers. Our combined sales force has made really great strides in building and converting our opportunity pipeline. In fact, our revenue cross-selling opportunity has doubled in value since our Analyst Day across large customers and also in the broad market.

During the year, we successfully achieved our initial $150 million of cost synergies. In addition, as previously announced, we're optimizing our internal manufacturing footprint, reducing our cost basis by another $100 million, while enabling a more agile operation that is positioned to capture new growth upside. All that said, given the complementarity of our combined product portfolio and customer relationships, we're increasingly confident in our objective to double LTC's revenue growth over the next few years. In short, we've created an industry-leading product portfolio and team of analog, RF and power engineers with capabilities that range from sensor to cloud from DC to 100 gigahertz and from nanowatts to kilowatts.

We exit 2018 in a stronger position than we've ever been and are extremely well prepared strategically and operationally to grow and take market share in 2019 and, indeed, beyond. In addition to our own preparedness, our confidence is grounded in a few externalities that transcend any potential short-term uncertainty in 2019, namely: immutable technology macro trends that are creating secular tailwinds for ADI; ADI's analog expertise between the physical and digital domains becomes ever more critical to our customers' business success; and simultaneously, our customers are partnering more deeply with us to get the full benefit of our technology capabilities and product solutions to enable them to meet the innovation demands of their customers, and we're very well aligned with these externalities and have been making strong progress during the past year to position ourselves for success in 2019 and beyond.

For example, in the wireless communication sector, you may have seen recent press around deployments of 5G massive MIMO beginning in Korea. ADI's software-defined transceivers are enabling those deployments, and this is just the beginning. Many other global carriers are expected to deploy 5G massive MIMO over the coming years. Much of the innovation of 5G systems is taking place in the radio subsystem. Given the increasing demands of -- for spectral space, thermal and cost efficiency, our comprehensive portfolio of software-defined mixed signal, RF, microwave and power management technologies will enable ADI to create even more compelling solutions for our customers in the years ahead. These massive MIMO-enabled radios contain an 8x increase in radio channels, representing a significant growth opportunity for ADI and the opportunity to capture, potentially, up to 4x the content when compared to current 4G solutions.

I should note also that in addition, power management attached assignments in this area are just beginning but progress thus far leads us to believe that our power portfolio will continue to provide tailwinds for us in communications in 2019 and in further years. And indeed, massive MIMO is just a stepping stone to millimeter-wave-based future generations. Here, carriers will look to increase the radio channel count up to 512

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channels per radio and we're very well positioned to, once again, solve these immense radio challenges with our comprehensive cutting-edge portfolio. So I believe we're really in the early stages of a multiyear growth cycle in this particular space.

So now turning for a moment to the industrial sector. Here, the digital factory envisioned by industry 4.0 is expected to increase productivity and lower cost. ADI has the heritage, the domain expertise and the most comprehensive set of technologies and capabilities to deliver the required level of precision and robustness our customers need. For example, we're building beyond our traditional strength in precision control, isolation and power products by adding communications technologies, such as industrial-grade deterministic Ethernet and sensors in areas such as depth, motion and vibration, which more than triples our content opportunity and expands our addressable market.

In automotive, FY '18 was a year of really solid progress and I have increased conviction that we're on the right path to return to our target growth rate of at least high single digits annually. Growth in our cabin electronics business has accelerated to a double-digit growth rate this past year, driven mainly by our long-term strength in audio processing. And our future is equally bright here. We're adding new vectors to our audio processing foundation, like A2B and C2B media transport technologies, and we're attaching our power management portfolio in these engagements as well, positioning us for continued strong growth in this particular subsector.

On the active safety side of the business, high-speed signal processing technology is required to deliver ever-increasing levels of precision in Level 3-plus autonomous vehicles. Here, ADI's radar, LIDAR and IMU solutions, coupled with power management, are strengthening our position across nearly all self-driving programs. And as is the case -- as in the case with Baidu, our customers are relying on ADI to achieve their vision of fully autonomous vehicles.

In the electrification application area, we've made stellar progress in strengthening our BMS solutions in FY '18. Our current generation delivers up to 20% more miles per charge compared to the competition and extends the batteries' useful life. We are now sampling our next-generation solution, which provides another efficiency and performance leap while adding additional safety features. Beyond that, the subsequent generation of our multigenerational roadmap includes architectural innovations that will change the way the BMS problems of power density, accuracy and weight are solved in the future.

And finally, I'd like to say a few words about our health care business and progress. Revenue in this market has increased at a double-digit growth rate over the past 5 years, and I believe it's really just getting started. In areas such as remote patient monitoring and digital x-ray systems, ADI's expertise in high-performance sensing, signal processing and power control is ever more critical to our customers. For example, in the area of digital x-ray imaging, several years ago, we made a pivot to a domain-inspired approach to solve our customers' most difficult problems.

We've leveraged our strong heritage of high-end component building blocks and have pushed the innovation curve to new levels to create highly integrated subsystems from photons to bits, for example. These solutions have simplified an intensely complex problem by reducing our customers' design challenges while lowering radiation dosage and simultaneously increasing image fidelity. We've thereby extended our addressable market to capture new levels of value. And in general, in the health care area, I believe that economic needs and new technology adoption are converging to enable a new vein of growth in the future for ADI.

So in closing, I put forth a constructive scenario here today, and while some may be a bit skeptical given the present macro uncertainty and geopolitical fears that beset our world, our confidence, I believe, is very well-founded. We have a diverse business across customers, products and applications that positions us to succeed and excel in any macro climate. We've added enormously to our cutting-edge technology portfolio during the year and we've deepened our customer engagements.

So we're in a position to capture the upside, while being agile enough to weather any perturbations in the marketplace. And amidst an environment of increasing change and complexity, we continue to leverage our greatest asset, our people, who continuously push the edge, learn and adapt to create ever more innovative solutions for our customers each and every day, which ultimately drives returns for our shareholders.

And so with that, I'd like to hand it over to Prashanth.

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Prashanth Mahendra-Rajah - *Analog Devices, Inc. - Senior VP of Finance & CFO*

Thank you, Vince. Good morning, everyone, and let me add my welcome to our Q4 '18 earnings call. As usual, with the exception of revenue and non-op expenses, my comments on the P&L line items will be on a non-GAAP or adjusted basis, which excludes special items outlined in today's press release. We wrap up 2018 with another record-setting quarter. Revenue at $1.6 billion and EPS of $1.55, and we converted this growth into strong cash flow generating over $2 billion on a trailing 12.

But before I get into the details of the income statement, let me cover the end markets. Our fourth quarter B2B revenue increased 13% year-over-year, led by double-digit growth in the industrial and communications markets. The highly diverse industrial end-market represented 49% of the sales in the quarter and increased 10% year-over-year. Most sectors increased compared to the year-ago quarter led by strength in instrumentation, health care, aerospace and defense. As expected, this growth was moderated by slower demand in factory automation, mainly related to China.

The comms market, which represented 22% of sales in the fourth quarter, increased once again at the double-digit rate year-over-year, driven by strong performance in both the wireless and wired markets. Growth in our wireless business was broad-based, and accelerated as continued momentum in our 4G business was augmented by early deployments of massive MIMO. We expect this to carry into 2019 and beyond as 5G represents an enormous opportunity for ADI.

Our auto business represented 15% of sales in the quarter and increased at a low single-digit rate year-over-year. Growth was led by cabin electronics and the BMS application.

And lastly, our consumer business represented 13% of sales in the fourth quarter. As expected, revenues declined year-over-year. However, portables declined less than expected.

Now moving on to the P&L. Revenue for the quarter was at the high end of our guidance at approximately $1.6 billion, increasing 4% year-over-year. Gross margins of 71.2% increased 30 bps year-over-year and were flat sequentially. OpEx in the fourth quarter was $452 million and at approximately 28% of revenue, well within our target of sub-30. And finally, op margins were a record at 43%.

As we continue to delever, non-op expenses in the fourth quarter declined to $56 million. And with our full year true-up, our Q4 tax rate was approximately 8%. Non-GAAP diluted earnings per share for the fourth quarter came in above the midpoint at about $0.55.

Now moving on to the balance sheet. Inventory increased 4% sequentially and days were 114 in the quarter, relatively flat from third quarter. Disti inventory declined sequentially and exited the year right in line with our target of 6 to 8 weeks. We generated free cash flow of approximately $2.2 billion or 35% of sales over the trailing 12 months. And as of yesterday's closing price, our free cash flow yield is 6.8%.

During the quarter, we repaid $225 million of debt and paid $179 million in dividends. And as we outlined in our last earnings call, we have resumed our share repurchase program, now that our leverage is sub-2. As of yesterday, we have purchased nearly 260 million worth of shares.

CapEx in the fourth quarter was $86 million, and we expect to continue to run at our model of approximately 4% of sales for 2019.

Before I move on to guidance, I want to remind you that in January -- in the January quarter, we will adopt a new rev rec standard, ASC 606, to coincide with the start of our 2019 fiscal year. We are among the last few SEC registrants to do so due to the timing of our fiscal year. We have historically deferred revenue and the related cost for shipments to certain distributors until the distributors resell their products to their customers. Upon adoption of ASC 606, we will recognize revenue upon shipment to our distributor.

We plan to provide a historical, quarterly end-market revenue look back under the new standard with our first quarter 2019 earnings release. Meaning, you will see changes in our historical growth rates as they will reflect revenue from shipping into distribution versus shipping out. But for context, during 2018, the change in channel inventory for the year was pretty minimal, as channel inventory increased in the first half and was reduced in the second half of the year. On average, over the past 3 years, channel inventory impacts annual revenue by plus or minus 1%, while quarterly variances could be and have been larger.

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Now on to guidance, which with the exception of revenue and non-op expenses are also on a non-GAAP basis and exclude the items outlined in today's release. As a reminder, the first quarter of 2018 was a 14-week quarter, so all of my comments on revenue growth and our commentary during the Q&A session will exclude this extra week, so we are normalizing our growth rates to give you a like-for-like comparison.

First quarter revenue is expected to be $1.51 billion at the midpoint, on both the old and the new rev rec methodology. To be clear, we are forecasting a midpoint of $1.51 billion on both a sell-in or new ASC 606 standard as well as a sell-through basis because we expect minimal change in channel inventory during the first quarter.

At the midpoint of guidance, we expect total revenue to increase 7% year-over-year on a sell-through basis and we expect our B2B markets of industrial, auto and comms in the aggregate to increase low double-digits year-over-year, led by the communications market. This would represent our eighth consecutive quarter of double-digit year-over-year revenue growth for our B2B markets.

Under the new rev rec method, year-over-year growth would be approximately 4% at a company level and at high single-digit rate in the B2B markets for the first quarter. We are planning for gross margins to be approximately 70.8, lower sequentially due to the normal shutdowns around the holidays as well as business mix. We're expecting operating expenses to be around $450 million at the midpoint. This is down slightly sequentially and does include some onetime items, so you will not see the usual lift going into Q2.

We expect op margins in the first quarter to be approximately 41% and we expect our non-op expenses to be approximately $56 million and our tax rate will be in the range of 14% to 16%. This tax rate is slightly higher than our previous outlook due to new IRS guidance released in September. Based on these inputs, diluted earnings per share, excluding special items, is expected to be $1.28 plus or minus $0.07.

Before moving on to the Q&A session, I want to inform you that this will be the last quarter we're going to be providing gross margin and OpEx guidance. This will be the only change as we will continue to provide the other items for outlook, including operating margin. This does not change our long-term operating model that we discussed at our Analyst Day of 70% plus gross margins and op margins in the range of 39% to 45%. We are making this transition as it aligns to the way we manage the business; that is, we focus on driving profitable growth and operating margin expansion.

So all in, it was a terrific quarter to cap off a very successful year for ADI. And while we are mindful of the economic uncertainty around us, I will echo Vince's optimism that we enter 2019 equally excited about the opportunities ahead.

And with that, let me turn it over to Mike to lead our Q&A session.

Michael C. Lucarelli - *Analog Devices, Inc. - Director of IR*

Thanks, Prashanth. Okay. Before we move to Q&A, I want to remind everyone of a couple points. First, we are moving to sell-in accounting starting first quarter '19. And second, the first quarter of 2018 was a 14-week quarter. As such, our commentary around expected growth in the first quarter 2019 will exclude these 2 factors. In short, our growth commentary will be on a 13-week sell-through basis.

Okay. Let's get to our Q&A session. (Operator Instructions) Jennifer, can we have our first question, please?

QUESTIONS AND ANSWERS

Operator

(Operator Instructions) Our first question comes from Tore Svanberg with Stifel.

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Tore Egil Svanberg - *Stifel, Nicolaus & Company, Incorporated, Research Division - MD*

The first question is on the industrial business. So obviously, it's very diversified, and I'm just wondering if you could comment a little bit on what your customers are seeing there as far as this slowdown? Are they sort of in a wait-and-see based on what the macro political situation is or are they, perhaps, a little bit more optimistic about '19? Just trying to gauge how your industrial base is feeling right now.

Vincent T. Roche - *Analog Devices, Inc. - President, CEO & Director*

Yes. Thanks, Tore. The -- well, I think I've talked with quite a few customers, both domestically here in America and internationally over the last quarter, 1.5 quarters, maybe 2 quarters. In the atmosphere of the kind of the macro uncertainty driven by trade war rhetoric and so on and so forth and the impacts of the tariffs, I'd say, generally speaking, customers are remaining optimistic though there is, obviously, concern which is dampening enthusiasm for laying down CapEx and taking a long-term view to demand. So I would say, at this point in time, what we're seeing though is cancellations are at a kind of a normal rate and lead times, for the most part, are pretty normal. So in the industrial market itself, we're seeing pockets of softness. I would say, in the automation part of our business, it's largely softening in China. And we are seeing strength, for example, in the electronic test and measurement side of our business. Obviously, health care has remained strong for the company. And I think aerospace and defense is also an area of continued growth and some good acceleration there over the last quarter or 2, so I think that provides you some color. And from our point of view, Tore, we've obviously been investing heavily from an R&D and customer engagement standpoint over the past -- really, the past decade. So I think for ADI, we're better positioned than we've ever been in that market. It is our #1 focus, I would say, and it's broad, it's deep, it's got many thousands of products, many thousands of customers associated with it. So we're optimistic about our capacity to continue to grow content and to gain share as we have been doing in '18 and beyond.

Michael C. Lucarelli - *Analog Devices, Inc. - Director of IR*

Thank you, Tore. Did you have a follow-up?

Tore Egil Svanberg - *Stifel, Nicolaus & Company, Incorporated, Research Division - MD*

Yes. Vince, that was very helpful. So I had a clarification question. You mentioned now with the synergies between Linear and ADI, I think you've used the word double. I'm just wondering, does that mean the revenue synergies are now up to $2 billion? Or is it -- if you could just clarify that statement.

Vincent T. Roche - *Analog Devices, Inc. - President, CEO & Director*

Yes. I think back in '17 when we had our Analyst Day, we were talking, at that point in time, about our visibility and confidence towards $1 billion. So yes, we're well above that now and looking at -- continuing to grow and we've certainly confidence that we've doubled that synergy number over the past year and a bit.

Michael C. Lucarelli - *Analog Devices, Inc. - Director of IR*

Yes. I'm going to say -- a bit why we're so confident we can double the growth there at Linear as that pipeline expands.

Operator

Our next question comes from John Pitzer with Credit Suisse.

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John William Pitzer - *Crédit Suisse AG, Research Division - MD, Global Technology Strategist and Global Technology Sector Head*

Vince, just on the comm sector, you had mid-20% year-over-year growth. Last quarter, you just put up almost 30% growth. This quarter, you did highlight some of the drivers there. I'm wondering if you could dissect that growth a little bit. I know that you were really positive about the backlog you had at Hittite now that it was under sort of your control from that M&A long product cycle designs. To what extent is Hittite helping to drive this growth? And I guess, are you at all concerned that some of this growth might be pull-ins from China trying to get these parts before the trade war escalates and potentially not being able to get these parts, just given how important massive MIMO and 5G are. Maybe you can help allay some of those concerns and just give us a little bit more detail there.

Vincent T. Roche - *Analog Devices, Inc. - President, CEO & Director*

Yes. Thanks, John. Good questions. So let me start with the latter part of your question first. I don't get any sense that there's any form of tension or panic buying by our Chinese customers to get ahead of any tariffs or trade war concerns. Remember as well, what we're seeing now is an accelerated build-out of, I would say, enhanced 4G and moving into the early stages of 5G. That's a multiyear process anyway, no matter what. So what I'm seeing is a good balance between what we see as the increasing demand from the carriers and the -- I would say, the supply from our customers to meet the carrier's demands. When you look at the -- put the whole thing together, we're looking at '19 being another year of double-digit growth. We have, as I said, we've got 4G tailwinds and that's driven by content gains we've been making over the last 3 years, I'd say. Hittite incidentally, just to give you a little bit of a benchmark here, when we inquired Hittite, it was roughly a $270 million trailing 12-month revenue company. The Hittite portion of our business is well over $400 million at this point in time. And it isn't just communications, it's where microwave and those radio frequency technologies are used and aerospace and defense and other parts of the instrumentation industrial market. So I think, when you put the massive MIMO addition to 4G or 5G, as some people call it, and the early stages of 5G, that gives ADI a tremendously increased opportunity value over 4G. And as I said in the prepared remarks, my sense is that we've got a 4x content improvement as 5G begins to ramp up here. So it's -- and that, by the way, doesn't include -- we're not including any specific targets for LT in that number, but there's a huge cross-selling opportunity. We're beginning to go to production with power designs at this point in time. So I think, the tailwinds are strong and ADI's content has grown, our portfolio has never been stronger, so that's what we're seeing. I think it's a share gain story for ADI.

Michael C. Lucarelli - *Analog Devices, Inc. - Director of IR*

Thanks, John. Do you have a follow-up?

John William Pitzer - *Crédit Suisse AG, Research Division - MD, Global Technology Strategist and Global Technology Sector Head*

Yes. Just quickly, guys. I hate to bring it up because it's such a small percentage of the revenue and the growth drivers, but you have historically just given us some color on the consumer segment and how we should be thinking about that, especially given the different launch times of flagship handsets. How do we think about consumer going into the January quarter?

Vincent T. Roche - *Analog Devices, Inc. - President, CEO & Director*

Well, looking into '19, we started the year off a bit stronger given the content that we have in some of the, say, older platforms. All that said, we're still expecting that consumer will decline somewhere between 10%, 20% on the portable side in '18, while the prosumer part of our business, which looks a lot more like a B2B sector, is continuing to perform well for the company. So I think the way to look at this, John, after this year's growth will be determined by essentially new sockets, either what we win or what we lose. That will determine, ultimately, what happens, I think, after '19. But as always, we're optimistic about where we're playing in consumer and we continue to be selective in the areas that we target and we're always seeking to increase diversity of application and customers, so I think that's the snapshot of consumer at this point.

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Prashanth Mahendra-Rajah - *Analog Devices, Inc. - Senior VP of Finance & CFO*

John, we're looking for a 7% increase on a sell-through basis for the consolidated company and 12% for B2B, so you should be able to impute the numbers you need for consumer.

Operator

Our next question comes from Craig Hettenbach with Morgan Stanley.

Craig Matthew Hettenbach - *Morgan Stanley, Research Division - VP*

Vince, can you just expand on the comment around the confidence in automotive returning to kind of high single digits? And then if you're able to frame it, I know there's some A2B programs that may help in the coming years as well as kind of BMS, but just any additional details would help.

Vincent T. Roche - *Analog Devices, Inc. - President, CEO & Director*

Yes. Thanks, Craig. Well, first and foremost, cabin electronics, that part of our business has done very well during '18 and we're positioned for more growth in '19, so the growth in that area was double digits in '18. And yes, the A2B application space is growing for the company. We've added this new media transport modality as well that we call C2B. And we're also now getting the benefit of adding LTC silent switcher technology into some of these sockets as well, so we're at the early stages of an operant in our power business there. I think as well, it was well publicized during the year that we had some troubles with our Battery Management Solution technology. But I think we've really turned the corner, particularly in the second half of '18. In the second half, we achieved double-digit growth and we expect '19, also, to be a double-digit growth performer for ADI. So as I mentioned in the prepared remarks as well, we're sampling our next-generation BMS. And we've got some very interesting architectural innovations as well coming on the back of that, that will change the way these systems are designed and implemented in the electrification activity. On the sensing side, again, I've talked about some of this in the prepared remarks across radar. We've got our -- we're sampling our 77-gigahertz image quality radar. We've a very interesting and growing diversified pipeline in the LIDAR sector that combines both LT and ADI mixed-signal technologies. And many customers are starting to use our IMU, inertial management units, in the kind of L3 plus autonomous driving area. So I think we have continued to accelerate during '18 in terms of stabilizing BMS and starting to get it back to a growth trajectory, and a lot of exciting things going on in autonomous VD goals as well. So hopefully, Craig, that frames it up for you.

Michael C. Lucarelli - *Analog Devices, Inc. - Director of IR*

Thanks, Craig. (Operator Instructions)

Operator

Our next question is from CJ Muse with Evercore.

Christopher James Muse - *Evercore ISI Institutional Equities, Research Division - Senior MD, Head of Global Semiconductor Research & Senior Equity Research Analyst*

I guess, more of a cyclical macro question. You talked about seeing some softness in China. Curious if you're seeing softness anywhere else, particularly as you think about strong U.S. dollar and potential impact to emerging market demand. Would love to hear your thoughts cyclically where you might be seeing the other pockets of weakness, if at all?

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Vincent T. Roche - *Analog Devices, Inc. - President, CEO & Director*

Yes. Thanks for the question, CJ. So yes, from a geographic perspective, I'm going -- what I'm going to talk about here is based on design in revenue, so what's happening in each region from an innovation design standpoint. I'd say, as we've come out of the year, all markets have increased year-over-year. Growth was led by China. And I'd say, looking at the sequential trends geographically, most markets were slightly up or a little down and no big moves one way or another to report there. Industrial was up year-on-year. It was a little weaker quarter-on-quarter. Automotive was up year-on-year, again, a little quarter -- a little weaker quarter-on-quarter. But we believe that was related primarily to macro effects there, SAR, China, this new testing modality that's being adopted in Europe, so -- but we expect it to come back in the first quarter to our target. And communications across-the-board, all the primary geographies in which -- where strong communications are up very, very big on a year-on-year basis and also sequentially. So -- and that broad-based strength was led by China as well as the EU, particularly in the communications area. So -- but, hopefully, that gives you a sense for the atmosphere on the geographic basis. Prashanth, do you want to add anything?

Prashanth Mahendra-Rajah - *Analog Devices, Inc. - Senior VP of Finance & CFO*

CJ, I would just add that, remember, we think about our geographic revenue based on where activity is designed. So when we think about, from a market standpoint, I mentioned factory auto -- sorry, factory automation was one that we're seeing some softness. Automated test equipment was the other area we were seeing some softness. But outside that, really, the rest of industrial has been staying in growth mode, so that's what's forming our sort of confidence for the Q1 outlook.

Operator

Our next question is from Mark Lipacis with Jefferies.

Mark John Lipacis - *Jefferies LLC, Research Division - Senior Equity Research Analyst*

I was wondering if you guys have noticed any shifting of the supply chain manufacturing out of China into other areas and if that is impacting your own business?

Vincent T. Roche - *Analog Devices, Inc. - President, CEO & Director*

I don't think there's anything really of note. First off, we're not so impacted by the tariffs, but there are some signs that our customers are trying to work around the cost impact of the tariffs. I think there are some passing on of the cost to end customers, and also a very small amount -- at least from our perspective, I'd say, a very small amount of mitigation by our customers by moving to areas not affected by the tariffs when it comes to manufacturing their products, but I think it's very, very de minimis at this point in time.

Prashanth Mahendra-Rajah - *Analog Devices, Inc. - Senior VP of Finance & CFO*

Mark, I think we're probably more familiar with our specific production and what we're seeing is customers looking at supply chain changes that allow them to maybe avoid staging products in the U.S. that would then get further assembled and have those go directly to other countries where the assembly happens and thereby, avoiding the tariffs.

Operator

Our next question is from Ambrish Srivastava with BMO.

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Ambrish Srivastava - *BMO Capital Markets Equity Research - MD of Semiconductor Research & Senior Research Analyst*

Vince, I just want to make sure I understood your comments about the slowdown. It sounds like you're characterizing it as a near-term uncertainty. You did talk about cancellations. Can you just help us understand what the order rates were doing as you were entering the current quarter? And then more importantly, what are the factory loadings going to look like at ADI? And structurally, the company is a lot more profitable than in the past cycles, just help us understand the playbook if we were to go into a deeper downturn?

Prashanth Mahendra-Rajah - *Analog Devices, Inc. - Senior VP of Finance & CFO*

Sure. I'll take some of those and Vince, you can add some pieces.

Vincent T. Roche - *Analog Devices, Inc. - President, CEO & Director*

Yes.

Prashanth Mahendra-Rajah - *Analog Devices, Inc. - Senior VP of Finance & CFO*

So let me take factory utilization. Certainly, we're headed into the holiday season, so our factory utilizations normally unaligned a bit for those that are impacted by Thanksgiving and then again for the Christmas-New Year period. So utilizations are coming down, but not necessarily linked to changes in the demand environment beyond our original planning areas. In terms of booking activities, certainly, our industrial business is seeing book-to-bill below parity and it's been a while since we've seen that. But as I mentioned, that we see most of that being heavily weighted from the 2 segments, factory automation and automated test equipment. Order activity has stabilized from where it was. Now I don't think we have the wherewithal to call the bottom here, but I'm just giving you the facts that we saw -- we certainly saw an improvement in October versus what we saw in September.

Vincent T. Roche - *Analog Devices, Inc. - President, CEO & Director*

Yes. So I think, Ambrish, another -- a little bit of color. So I would say, for the most part, what we're seeing is really a pause rather than any -- we're not seeing cancellations as such. I think it's a pause. It's a level -- it's the macro uncertainty that's causing customers to be a little cautious. Lead times for the company are really normal, and I would say -- as I've just said, cancellations are just normal. And just to give you a little more depth of color on that, so the legacy ADI is well within the normal range of supply chain metrics. In other words, greater than 90% of our portfolio shipping within the normal 4- to 6-week window that we're planning to report. LTE is a little more mixed. We've had some, I would say, tightening of supply. Demand has been strong and supply has been a little tight, but we've been investing aggressively and putting in place new capacity, in fact, over the last couple of quarters, to support not just today's shortfalls, but also to support the future growth that we're expecting and increasingly optimistic about. So the book-to-bill as just -- as Prashanth said, just a little below parity on the B2B side, driven largely by industrial. So -- but I think the book-to-bill that we've given or that we're seeing is very supportive of the guidance that we put out there.

Operator

Our next question is from Ross Seymore with Deutsche Bank.

Ross Clark Seymore - *Deutsche Bank AG, Research Division - MD*

A bigger picture question for you, Vince, is I think you said that the guidance would imply the eighth consecutive quarter of double-digit year-over-year growth in your B2B business. A very impressive track record, for sure. That's -- as I go back in my model, that's the longest stretch of double-digit growth I can find at any point in time. So I guess, 2 points on that. How much of that do you think is company-specific share gains, target investments, et cetera, versus a cyclical uplift? And how do you view the sustainability of the growth rate or even the target growth rate for your B2B segment?

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Vincent T. Roche - *Analog Devices, Inc. - President, CEO & Director*

Yes. There's a lot of very good questions in there, Ross. So I'd say -- I mean, it's very hard to parse out precisely what is market, what is ADI. Clearly, we, as a company, have -- we retooled the entire strategy of the company, 8, 9, 10 years ago to focus very, very heavily on the B2B area. In fact, we're spending today 95% for R&D in the B2B spaces and most of our customer engagement activities as well, of course, are in the B2B areas. So the addition of the added R&D focus on the legacy ADI portfolio in the B2B area, the addition of Hittite and now LTC, where LTC was largely focused on B2B, I think positions the company well. We have been taking share, that I'm sure of, and I believe we will continue to gain share. And of course, we were aided by favorable macro trends, I think, generally speaking. PMIs have been positive for the last several quarters and GDP has been strong. So obviously, the environment is strong, but I think ADI is executing in a more focused, more intense way as well in capturing the opportunity. So we believe, again, that B2B will increase within our -- I think a more moderated growth range. We've said that, for the long term, that if we can grow our B2B business, kind of 2x to 3x GDP, we would be content on an ongoing basis. And that's my sense for '19 as well, barring any macro cataclysm that -- that's what we're going to see again in the -- we're going to see that kind of growth rate in the coming year.

Operator

And our final question comes from Vivek Arya with Bank of America Merrill Lynch.

Vivek Arya - *BofA Merrill Lynch, Research Division - Director*

Vince, just a question on the competitive landscape. You mentioned massive MIMO is the strong area of growth for you. Xilink has also been talking about their RF SoC product. I'm wondering how do you see the competitive landscape shaping up and what's your visibility in design wins on next-gen 4G and then 5G?

Vincent T. Roche - *Analog Devices, Inc. - President, CEO & Director*

Yes. So I think, first off, there are many, many solution variants out there when -- between the antenna and the bit streams, so to speak. And there's -- we have the strongest portfolio of technologies from -- right from the antenna down into the bit stream area. So as I said earlier, as we move into the 5G, the early stages of 5G here, we're looking at potentially 4x the content availability compared to the classical 4G that we've been part of over the last 5, 7 years. And when we get into the millimeter wave side of things, the -- we have, again, we've got the broadest portfolio. We can architect in a very flexible way to all the various customer needs. So as 5G millimeter wave comes in, we're looking at potential gains of 8, 10 plus in terms of potential content just given the channel count on the radio transceivers which, by the way, is where most of the innovation has taken place in these 5G systems, at least, until they virtualize in the early '20s or so. So there's -- there are kind of 3 or 4 major building blocks in these base stations these days. There's the classical transceiver, there's the massive MIMO addition, there's all this power technology that we can bring to bear now as well for our customers. And then there's the digital baseband, the digital front-end. And we're innovating not just in the analog space, but we're also pushing the boundaries incidentally on the digital side. And those boundaries, they blur, they shift, they ebb and they flow over multiple generations. But in our software-defined transceivers, for example, we've taken a significant amount of digital content and combined it with our converter technologies and our radio interface capabilities and dramatically reduce the footprint of the radio and cut the power levels down as well. So those are all important answers to very, very critical problems that our customers have. So my sense is, over the next, say, 5 years until we get into millimeter wave, we're looking at a potential content increase of 3x to 4x, and then it's a question of how many radios deploy. And -- but we're very, very well positioned from the content and architectural coverage standpoint.

Michael C. Lucarelli - *Analog Devices, Inc. - Director of IR*

Okay. Thank you, Vivek. And thank you, everyone, for joining us this morning. A copy of the transcript will be available on our website and all available reconciliations and additional information can also be found at the quarterly results section of our website. We look forward to seeing you this quarter at Credit Suisse conference and the BMO conference in the coming weeks, and thanks for joining us. Have a great Thanksgiving.

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Operator

This concludes today's Analog Devices conference call. You may now disconnect.

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