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PRESENTATION

Elizabeth Sun Taiwan Semiconductor Manufacturing Company Limited - Senior Director of Corporate Communication Division

(foreign language) Happy new year to everyone. Welcome to TSMC's Fourth Quarter 2018 Earnings Conference and Conference Call. This is Elizabeth Sun, TSMC's Senior Director of Corporate Communications and your host for today. Today's event is webcast live through TSMC's website at www.tsmc.com. (Operator Instructions) As this is conference is being viewed by investors around the world, we will conduct this event in English only.

The format for today's event will be as follows: first, TSMC's Senior Vice President and CFO, Ms. Lora Ho, will summarize our operations in the fourth quarter 2018 followed by the guidance for the first quarter of 2019. Afterwards, Ms. Ho and TSMC's CEO, Dr. C.C. Wei, will jointly provide company's key messages. Then TSMC's Chairman, Dr. Mark Lu, will host the Q&A session where all 3 executives will entertain your questions.

For those participants on the call, if you do not yet have a copy of the press release, you may download it from TSMC's website at www.tsmc.com. Please also download the summary slides in relation to today's earnings conference presentation.

As usual, I would like to remind everyone that today's discussions may contain forward-looking statements that are subject to significant risks and uncertainties which could cause actual results to differ materially from those contained in the forward-looking statements. Please refer to the Safe Harbor notice that appears in our press release.

And now I would like to turn the microphone to TSMC's CFO, Ms. Lora Ho, for the summary of operations and current quarter guidance.

Lora Ho Taiwan Semiconductor Manufacturing Company Limited - CFO & Senior VP of Finance

Thank you, Elizabeth. First of all, happy new year, everyone. Thank you for joining us today. My presentation will start with financial highlights as usual for the fourth quarter and a recap of 2018 for the whole year. Then after that, I will provide a guidance for the first quarter.

Fourth quarter revenue increased 11.3% sequentially to TWD 290 billion as our business benefited from the strong demand for our 7-nanometer technology covering both mobile and high-performance computing applications.

Gross margin increased 30 basis points sequentially to 47.7% reflecting the absence of the virus incident that occurred in the third quarter, an improvement in back-end profitability, higher capacity utilization and the more favorable foreign exchange rate. These factors helped offset the unfavorable technology mix.

Total operating expenses increased by TWD 2.7 billion, thanks to the operating leverage, only represented 10.6% of the revenue versus 10.8% in the prior quarter. And operating margin increased by 40 basis points sequentially to 37%.



Overall, our fourth quarter EPS reached \$3.86 and ROE was 24.6%.

Now let's take a look at revenue by technology. 7-nanometer process technology continued to ramp strongly and accounted for 23% of wafer revenue in the fourth quarter. 10-nanometer was 6% and the combined 16/20-nanometer contribution accounted for 21%. Advanced technologies, 28-nanometer and below, accounted for 67% of wafer revenue, up from 61% in the third quarter.

On a full year basis, 7-nanometer contribution reached 9% of wafer revenue in 2018. 10-nanometer was 11%. And the combined 16/20-nanometer contributions was 23% of wafer revenue. Advanced technologies accounted for 63% of total wafer revenue, up from 58% in 2017.

Now let's take a look at revenue contribution by application. During the fourth quarter, Communication increased 27%, while Computer, Consumer and Industrial/Standard decreased 2%, 35% and 3%, respectively. On a full year basis, Computer, Communication and Industrial/Standard increased 61%, 1% and 3%, respectively; while Consumer decreased 17%.

Moving on to the balance sheet, we ended the fourth quarter with cash and marketable securities of TWD 695 billion, an increase of TWD 91 billion from the last quarter. On the liability side, current liabilities increased by TWD 19 billion.

On financial ratios, accounts receivable turnover days was 41 days. Days of inventory decreased 6 days, to 67 days due to stronger wafer shipment during the fourth quarter.

Now let me make a few comments on cash flow and CapEx. During the fourth quarter, we generated about TWD 189 billion cash from operations and spent \$114 billion in capital expenditures. As a result, we generated free cash flow of 75 billion and our overall cash balance increased 89 billion to reach 578 billion at the end of the fourth quarter. In the U.S. dollar terms, our fourth quarter capital expenditure reached 3.7 billion and a total USD 10.5 billion for the full year CapEx.

Now I would like to give you a recap of our performance in 2018. 2018 was another growth year for TSMC as we continue to set new records in both revenue and earnings. Despite the weakening macroeconomic outlook and demand headwinds in certain end applications, our revenue grew 6.5% year-over-year in U.S. dollar terms and 5.5% in NT dollars terms to reach about TWD 1 trillion. Main contributor was the strong demand for our 7 and 10-nanometer wafers.

Gross margin decreased 2.3 percentage points to 48.3% reflecting a lower level of capacity utilization, the unfavorable technology mix and an unfavorable foreign exchange rate during the year.

Our operating margin decreased 2.2 percentage points to 37.2%, while we continue to increase investment in R&D for 7-nanometer and 5-nanometer technologies.

Our effective tax rate was 11.7% in 2018, which was lower than 13.5% in 2017, due to lower retained earning tax.

Full year earnings per share was \$13.54.

On cash flow, we generated 574 billion in operating cash flow for the whole year, spent TWD 316 billion or USD 10.5 billion in capital expenditure, leaving \$258 billion in free cash flow. We also paid TWD 207 billion or \$8 per share in cash dividend, which is an increase of 14% from the 2017 level.

I have finished my financial summary. Now let's turn to the forecast, first quarter guidance. Based on the current business outlook, we expect first quarter revenue to be between USD 7.3 billion and USD 7.4 billion representing 22% sequential decline.

Based on the exchange rate assumption of USD 1 to TWD 30.6, our first quarter gross margin is expected to be between 43% and 45%. And operating margin is expected to be between 31% and 33%.

This concludes my financial presentation. Let me follow by making a few comments about the near-term demand and inventory, CapEx, and profitability.

Now on your trend demand and inventory, we conclude the fourth quarter with revenue of 287.8 billion or USD 9.4 billion in line with the guidance given 3 months ago. This result was mainly driven by the continued steep ramp of our industry-leading 7-nanometer technology.

Concluding 2018, semiconductor excluding memory growth was 8%, while foundry grew 6%. TSMC's revenue grew 6.5% year-over-year in U.S. dollars mainly due to strong demand for our 7-nanometer technology.

Moving into first quarter '19, our business will be dampened by the overall weakening of the macroeconomic outlook, mobile product seasonality and the high level of inventory in the semiconductor supply chain.

Due to the overall softening economic environment, semiconductor supply chain inventory exiting 2018 stay at a much higher level than seasonal. We expect the excess inventory in the semiconductor supply chain will take a couple of quarters to digest. And the overall supply chain inventory will gradually approach to the seasonal level around the middle of this year.

Now let me make comments about the CapEx. As I have said before, we believe USD 10 billion to USD 12 billion capital budget will be sufficient to support our average growth of 5% to 10% per annum in the next few years.

Given the macroeconomic outlook in 2019, we are tightening this year's capital spending by several hundred million dollars to a level between USD 10 billion to USD 11 billion. That said, our commitment to support customers product ramp remained unchanged.

Out of this USD 10 billion to USD 11 billion CapEx for 2019, about 80% of the capital budget will be allocated for other advanced process technologies, which includes 7-nanometer, 5-nanometer and 3-nanometer. A little more than 10% will be spent for advanced packaging and mask making, and about 10% will be spent for specialty technologies. So this is about CapEx.

Let me follow by making some comments about profitability. Okay, as I stated in our first quarter 2018, earnings call, I said TSMC's profitability is determined by the following 6 factors: Number one is leadership technology development and ramp up and pricing and cost reduction and capacity utilization and foreign exchange rate and last one is technology mix. All these factors, except capacity utilization, determine our standard gross margin.

I have just guided first quarter gross margin to decline by 3.7 percentage points sequentially at the midpoint of the guidance. This is primarily attributable to a lower utilization due to the overall weakening macroeconomic environment, the mobile product seasonality and the high level of inventory in the supply chain.

Due to the recent changes in high-end smartphone business condition, our 7-nanometer capacity will see a substantial cutback on utilization rate in fourth quarter -- in first quarter and second quarter which is expected to hit our gross margin by more than 4 percentage points in each quarter. Going forward, to better manage our leading edge utilization rate, we will be working closely with customers for more effective capacity planning.

Looking at other profitability factors for 2019, our 7-nanometer ramp-up remains very strong. We continue to provide value to customer and drive aggressive cost reduction. In the meantime, we are increasing our resource in specialty technologies development to backfill our mainstream capacity technology.

With all the above factors, we expect our gross margin in the second half of this year will be better than first half. And we believe our long-term gross margin target of about 50% is still a good target.

Thank you for your listening. Now let me turn the podium to C.C. for his remarks.



C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

Thank you, Lora. Good afternoon, ladies and gentlemen.

Let me start with our 2019 full year outlook. We forecast a slowdown in global GDP growth from 3.2% in 2018 to 2.6% in 2019 due to the weakening macroeconomic conditions leading to a low growth for the semiconductor industry.

For the full year of 2019 we forecast the overall semiconductor market excluding memory will grow 1% while foundry growth will be flat.

For TSMC, we estimate our business will grow only slightly in 2019 given the slowing economic environment. Our 2019 business will be supported by the continuing demand for our 7-nanometer where we see strong interests from our customer in high-performance computing, mobile and automotive.

Even with a slow year like 2019, we firmly believe AI and 5G are the megatrends that will drive the future semiconductor growth. And we reaffirm our long-term growth projection of 5% to 10% CAGR.

Now I will talk about our 5-nanometer status. Our N5 technology development is well on track, with customer tapeout schedule for first half 2019 and volume production ramp in first half 2020. We are already in preparation for N5's ramp. All applications that are using 7-nanometer today will adopt 5-nanometer.

In addition, we are expecting the customer product portfolio at N5 and see expanding addressable market opportunities. We expect more applications in HPC to adopt N5. Thus we are confident that N5 will also be a large and long-lasting node for TSMC.

Now I will talk about the ramp-up of N7 and N7+. Our 7-nanometer has been a very steep and successful ramp in second half 2018 and we expect continued ramp through 2019. Our customer portfolio is growing stronger while more applications such as HPC and automotive are coming to N7 as well.

Customer tapeouts activities at N7 continue to be strong despite the cautious macro outlook. We are actually seeing an increase in silicon content for AI and 5G-related product designs. We expect that 7-nanometer to contribute more than 25% of our wafer revenue in 2019.

Our N7+ yield rate is progressing well and comparable to N7. N7+ volume production is scheduled to begin in second quarter this year. As I have stated before, we are working with several customers on N7+ to support their second and third wave product designs, and we expect the N7+ price contribution to the 7-nanometer family will grow increasingly larger over the next few years.

Now I'll talk about TSMC's mature nodes strategy and our new 8-inch facility. For mature nodes, our strategy is that we do not increase larger capacity at mature nodes but rather we work with customers to develop specialty technologies that create differentiated and longer-lasting value to customers. Our recent plan for an extension at Fab6 in Tainan is a part of this strategy. The extension is not an increase of wafer capacity per se. But the purpose is to increase the clean room space for more specialty tools. With successful execution of our mature node strategy, we believe we will be able to continually deliver good profitability in the future.

Finally, I will talk about our most important growth contributor in the next 5 year. As I just stated, we believe 5G and AI will be the megatrend underlying the ubiquitous computing which will drive the semiconductor growth in the future.

With the successful ramp of 7-nanometer, we are able to expand our customer product portfolio and can add applications related to PC and tablets to the HPC platform. With this inclusion, we believe HPC will become the largest contributor to our business in terms of revenue growth in the next 5 years.

Thank you for your attention.

Elizabeth Sun Taiwan Semiconductor Manufacturing Company Limited - Senior Director of Corporate Communication Division

All right. This concludes our prepared statements. Before we begin the Q&A session, I would like to remind everybody (Operator Instructions) Questions will be taken both from the floor and from the call. Should you wish to raise your questions in Chinese, I will translate it to English before our management answers your question. (Operator Instructions) .

Now let's begin the Q&A.

QUESTIONS AND ANSWERS

Elizabeth Sun Taiwan Semiconductor Manufacturing Company Limited - Senior Director of Corporate Communication Division

First question will be coming from Crédit Suisse, Randy Abrams.

Randy Abrams Crédit Suisse AG, Research Division - MD and Head of Taiwan Research in the Equity Research Department

The first question I had was on the guidance both for the sales and the CapEx. You're lowering sales outlook to just slight growth but only making a small change to CapEx. Could you talk about the assumptions you're making for further market share gains or demand recovery? And also the assumptions for 5-nanometer and EUV to keep the CapEx intact.

Mark Liu Taiwan Semiconductor Manufacturing Company Limited - Chairman of the Board

Okay. Good afternoon. And I want to say happy new year again. Welcome to the investor conference. Your first question, I would like C.C. to answer.

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

You're asking about we've only grow slightly but CapEx did not decrease dramatically. Good question. We now become more conservative on CapEx it's because of we forecast a slower -- a lower 5-nanometer demand at the initial ramp. However, we still have to prepare enough capacity to support our customers. And we believe that today, with more than few hundred million U.S. dollar is to reflect the reality of expecting the high-end smartphone a little bit slower growth. But this year, this year is because of 7-nanometers of capacity has been built. And the demand -- actually, we forecast the number of the units of the smartphone, especially high-end smartphone, to be negative growth. Although we are still want to say that. For TSMC, the year-on-year from 2019 compared to 2018, the smartphone -- the mobile business, we still grow slightly on this year regardless if the unit is dropping, okay. And as a result, we expect -- as I just said, we expect the foundry business will be flat, but TSMC still grows slightly.

Randy Abrams Crédit Suisse AG, Research Division - MD and Head of Taiwan Research in the Equity Research Department

One follow-up to that and then I'll ask a second question, for that capital spending change you mentioned on EUV, could you talk now about kind of magnitude and steepness? Like what type of ramp we should expect next year for that node? And on the CapEx, are you making any consideration with the slower environment to reuse more equipment? So that's a follow-up to the first question.

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

Yes, we do expect that we -- in the 5-nanometer we'll use some of the 7-nanometer's equipment. To answer your question more correctly actually why it only drop a little bit. A few hundred million U.S. dollar because of EUV tool actually we already buy a lot, all right? And we expect that will continue to grow also. So the ramp-up of the 5-nanometer now definitely was slower than we expected. But we still think it's a long-lasting node because of all our customers who are using 7-nanometer today are engaged with TSMC today in their product design. So and in addition to that, we also increased our product portfolio, our customers' product portfolio. And that will add something to HPC application. So look, it's not a very promising in this year but we still have the confidence that 5% to 10% CAGR will be sustained.

Randy Abrams Crédit Suisse AG, Research Division - MD and Head of Taiwan Research in the Equity Research Department

A change on the second question, a follow-up 1 more. For the 5-nanometer, if you could just talk a little bit more what's driving some of the change in consideration if it's anything about the EUV readiness versus the cost structure, mature 7 versus 5. Maybe if you could go into if now you expect a bigger 7 initially, what the factor for that is?

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

Let's talk about EUV's readiness. We are progressing really well. So that's why I said the 7+, which is using the EUV, will start production in second quarter this year. And our 5-nanometer's technology development, a lot are based on the EUV's progress. And 5-nanometer's technology development is on track. So that's 1 thing. Why we lower down CapEx is because we expect the high-end smartphone's growth will not be as strong as we used to project before, okay? We lower it down a little bit but still, we still think the high-end smartphone will grow because of 5G and AI's application.

Randy Abrams Crédit Suisse AG, Research Division - MD and Head of Taiwan Research in the Equity Research Department

I guess the question was more EUV for it to be slower than original. What drove the change to the EUV or to the 5-nanometer?

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

I did not say the EUV will be slower.

Randy Abrams Crédit Suisse AG, Research Division - MD and Head of Taiwan Research in the Equity Research Department

5-nanometer.

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

5-nanometer, no. It will continue.

Mark Liu Taiwan Semiconductor Manufacturing Company Limited - Chairman of the Board

The CapEx this year, majority of it has been on 5, not even 3-nanometer. EUV's productivity continued to improve. And that modulate the CapEx we need to invest. So from the number we are very confident that our 5-nanometer will ramp according to our previous plan. However, we do put a more conservative, tighten up our CapEx under those confidence to improve the productivity and make sure the lead time is tightened up enough to minimize the CapEx.

Randy Abrams Crédit Suisse AG, Research Division - MD and Head of Taiwan Research in the Equity Research Department

Okay. Lower 5-nanometer initial ramp though, could you talk about that? Like the rationale for that lower initial 5-nanometer ramp?

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

I just say we expect a higher growth, but right now, we're now a bit more conservative on the high-end smartphones.

Randy Abrams Crédit Suisse AG, Research Division - MD and Head of Taiwan Research in the Equity Research Department

(inaudible)

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

Yes.

Elizabeth Sun Taiwan Semiconductor Manufacturing Company Limited - Senior Director of Corporate Communication Division

Next question will be coming from Citigroup's Roland Shu.

Roland Shu Citigroup Inc, Research Division - Director and Head of Regional Semiconductor Research

First question is, C.C, you said for the mobile business this year, you still expect some growth. But under your overall year, on the whole year revenue growth just slightly. So how about the growth of the other platform products: IoT, HPC and automotive?

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

Okay, Roland, you asked a good question. Smartphone grows slightly. IoT grows double-digit. Automotive will be flat. HPC, if we're excluding the cryptocurrency mining, HPC also grows slightly. But cryptocurrency is a big drop from 2018 to 2019. So if we put the cryptocurrency together in the HPC, it's a big drop. It's almost a double-digit.

Roland Shu *Citigroup Inc, Research Division - Director and Head of Regional Semiconductor Research*

May we have more color for the breakdown for these four platforms? The revenue breakdown in last year in 2018?

Mark Liu *Taiwan Semiconductor Manufacturing Company Limited - Chairman of the Board*

This one maybe, Lora, you can directly answer on the number.

Lora Ho *Taiwan Semiconductor Manufacturing Company Limited - CFO & Senior VP of Finance*

For 2018, smartphone roughly accounts for 45% of our wafer revenue. HPC, about 30%, 32%. IoT, single-digit, 6%; automotive, 5%; digital electronics, 6% and there's other 5% here.

Roland Shu *Citigroup Inc, Research Division - Director and Head of Regional Semiconductor Research*

And may I know how big of the contribution for cryptocurrency last year?

C. C. Wei *Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman*

A lot.

Mark Liu *Taiwan Semiconductor Manufacturing Company Limited - Chairman of the Board*

We don't want to specify too much of the segment, particularly it belongs to one of the big customers. So...

Roland Shu *Citigroup Inc, Research Division - Director and Head of Regional Semiconductor Research*

And the other question is Lora said both 7-nanometer utilization will be dropped a lot in first half. But the whole year, the 7-nanometer revenue contribution commented by C.C. will be about 25%. So that means that -- above 25%. That means the second half, the 7-nanometer contribution will be very strong. So may we have more color? What kind of application is driving such a strong 7-nanometer demand?

C. C. Wei *Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman*

Okay. A lot of it because of seasonality of the high-end smartphone. So in the second half, we expect to ramp up the high-end smartphone again. The first half is a little bit kind of cyclical in the high-end smartphone.

Mark Liu *Taiwan Semiconductor Manufacturing Company Limited - Chairman of the Board*

To be honest, this high-end smartphone drop in the first quarter is -- came a little bit sudden. So the inventory in the supply chain is quite a lot. So that may push the first half drop. But the second half, we expect the new product launch will carry on another wave of ramp.

C. C. Wei *Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman*

So Roland, I'll give you more color. How about that? The second half, we already said that we have more customers' product portfolio. So that will expand into the high performance computing. Some of the product will enter into production slightly from fourth quarter and extended to the next year.

Roland Shu *Citigroup Inc, Research Division - Director and Head of Regional Semiconductor Research*

For the 7-nanometer follow-up, I think 7+ will be also included in the whole 7-nanometer. And N7+ total revenue will still be somewhere around the TWD 1 billion.

C. C. Wei *Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman*

That's correct.

Mark Liu *Taiwan Semiconductor Manufacturing Company Limited - Chairman of the Board*

7+ is not a major node, but rather it is a technology good for second wave and third wave customers. So it is come up slower when the first wave products or first wave customers ready to convert to the lower -- to another improved version. So it's -- it doesn't conflict with our 5. 5 is another major node.

Elizabeth Sun *Taiwan Semiconductor Manufacturing Company Limited - Senior Director of Corporate Communication Division*

Next question will be coming from Goldman Sachs' Bruce Lu.

Bruce Lu *Goldman Sachs Group Inc., Research Division - Equity Analyst*

So I want to ask about smartphone semi content addressable market. TSMC management used to provide semi content for high-end smartphone, medium smartphone and low end smartphone in the past. Can we ask what kind of semi content growth either come in 1 or 2 years with different segments smartphone? And also, what kind of semiconductor growth for smartphone move from 4G to 5G, especially for the addressable market for TSMC?

C. C. Wei *Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman*

You want to specify what is semiconductors' content into the high-end smartphone, actually, you want to narrow down to a specific number just like before, I don't think we could do it today because of there's a lot of application, new application that add into, that's one, such as AI and something. We expect in the future AR/VR will be inside. The second thing is 5G itself will increase a lot in frequency band. And so that will add the silicon content inside. I'll give you a kind of feeling that the smartphone unit will drop a few percentage. TSMC will still grow the smartphone business. So that means there's a lot of increase in that revenue, it's because of silicon content, in terms of the smartphone business.

Bruce Lu *Goldman Sachs Group Inc., Research Division - Equity Analyst*

But moving to 5G, as you mentioned that there are a lot of RF content those kind of semiconductor increase, do we see that having any impact to our business?

C. C. Wei *Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman*

You could -- you have a good question. Yes, move into 5G, the RF become more complicated. And so you have larger area in the RF chip. And so we expect silicon content per se that will increase. And so the silicon -- the content in the smartphone will increase.

Bruce Lu *Goldman Sachs Group Inc., Research Division - Equity Analyst*

But can we somehow quantify the number?

C. C. Wei *Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman*

Not very.

Mark Liu *Taiwan Semiconductor Manufacturing Company Limited - Chairman of the Board*

Let me put some color. I mean, this is based on of course forecast number. So nothing -- may not be accurate but we have a picture about the silicon content supporting C.C. Wei's description. On a high-end smartphone, we see the silicon content increase. Actually it's increased every year, very fast. On the mid end, it will increase slightly. On the low end, it's less predictable, but we take the decrease is slightly. So that's the picture. And most of our business in the smartphone is -- belongs to the high-end. So we are going to enjoy the silicon content with the equipment of our technology, leading-edge technology.

Bruce Lu *Goldman Sachs Group Inc., Research Division - Equity Analyst*

Okay. My second question will be that management just mentioned that 5% revenue growth CAGR will maintain. Management first mentioned that in 2017. And with slow growth in 2019, if you do that after-math, you now expect that more than double-digit growth for the coming 2 years?

C. C. Wei *Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman*

You can calculate it.

Bruce Lu *Goldman Sachs Group Inc., Research Division - Equity Analyst*

Do I read it correctly?

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

I want to reaffirm that the 5% to 10% that CAGR will sustain, we have confidence on that. And you calculate it.

Bruce Lu Goldman Sachs Group Inc., Research Division - Equity Analyst

So the 5-year is 2017 to 2021, right?

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

Yes.

Elizabeth Sun Taiwan Semiconductor Manufacturing Company Limited - Senior Director of Corporate Communication Division

All right. Next question will be coming from CL Securities Sebastian Hou.

Sebastian Hou CL Securities Taiwan Company Limited, Research Division - Research Analyst

My first question is I would like to get TSMC's brains on the overall semi-cycle inventory. Remember, 3 months ago, the company talked about that you are not too worried about the inventory situation compared to the 4Q '17. But today, you're talking about -- you just talk about that there's a lot of excess of inventory out there. So I was just wondering what has happened in the past 3 months? Is it more due to demand slowdown a lot or it's still more due to there are some hidden inventory now that emerged?

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

I will say it's more due to the sudden drop in the demand rather than there's some hidden inventory that we cannot see.

Sebastian Hou CL Securities Taiwan Company Limited, Research Division - Research Analyst

Okay. Can you elaborate more on the -- which application, which end application has seen the most significant declined in demand?

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

High-end smartphone is one thing, and then others seeing the drop, actually you can imagine that cryptocurrencies mining, they dropped quite a lot. And then related to that might be some of the high-performance computing that you can see from other applications that related to the cryptocurrency mining.

Sebastian Hou CL Securities Taiwan Company Limited, Research Division - Research Analyst

And in terms of the inventory digestion, I think Lora talked about that. The inventory will go back to a more seasonal average level by mid of this year. So usually, in the down cycle, we usually see the supply chain will tend to overcut inventory to below normal. So in mid this year that means that we are now ready or is that below normal level can before or after that?

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

We expect it to be a reasonable level that it can extend the business. And we expect that this kind of a demand will recover gradually from first quarter, second quarter and then moving to the second half of this year. So that's why we expect at mid--- in the middle of this year all the inventory will go back to the reasonable or seasonal level. Whether it will be much lower or something like that, we did not expect that yet.

Sebastian Hou CL Securities Taiwan Company Limited, Research Division - Research Analyst

Okay. Just one last question from me is if you compare this down cycle to the past, I know that TSMC has not offered utilization rate details for many years already. But just to give us a rough idea. On the current utilization rate you are seeing now in first half of this year compared to the UTR we've seen in 2015, 2012. Or say post a financial crisis, is it likely to be the lowest point that we have seen since then?

Mark Liu Taiwan Semiconductor Manufacturing Company Limited - Chairman of the Board

This -- as Lora just presented, the utilization impact this quarter is really mostly come from 7-nanometer. Although other nodes utilization is lower, but if you compare with the last downturn, if you take 2009 for example it's not that low. So 7-nanometer really is the major underutilized. We think it's temporary.

Sebastian Hou CL Securities Taiwan Company Limited, Research Division - Research Analyst

So can we assume -- is it fair for us to assume that the UTR is not as slow as in the 2009 yet but there is already lower than what we have seen in 2011, '12 that cycle in 2015 cycle?

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

You are right, you are right.

Elizabeth Sun Taiwan Semiconductor Manufacturing Company Limited - Senior Director of Corporate Communication Division

Next question will be coming from UBS Bill Lu.

Bill Lu UBS Investment Bank, Research Division - MD and Asia Semiconductors Analyst

First question is we've seen a pretty sharp drop-off in demand. And Dr. Wei I think made a comment that in the future, we will work with customers to plan for capacity differently. Wondering if you could talk a little bit more about that as far as what can be done. Is it better planning? Is it diversification? Is it the different payment terms? Can we just talk a little bit about what are some of the things?

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

Well, in fact, this is kind of the way we deal with our customer. So there will be a better planning process. TSMC as well as TSMC's customer, I believe that we are learning a lot during this cycle and then we will be more prudent or have found ways at TSMC and customer can work together for the better planning of the capacity in the future without -- to summarizing in one wording, we will be more conservative. But again, we will not lose our support to our customer.

Mark Liu Taiwan Semiconductor Manufacturing Company Limited - Chairman of the Board

Wider product portfolio is another factor you mentioned.

Bill Lu UBS Investment Bank, Research Division - MD and Asia Semiconductors Analyst

Second question is for Lora. Can you talk about the depreciation for this year? And I'm asking that because I feel like TSMC over the last year, 1.5 years has brought quite a few EUV tools. And I believe you don't depreciate until these tools are in production, right? And so if you look at the CapEx trend versus the depreciation trend, is there a different linearity because all of a sudden the tools you bought, I don't know, 10, 15 tools need to be depreciated.

Lora Ho Taiwan Semiconductor Manufacturing Company Limited - CFO & Senior VP of Finance

You're right. We started depreciating the tool when it gets into the productions. The depreciation pattern versus the CapEx changes is not linear, also because whether the CapEx is front end loaded, back end loaded also will impact the whole year depreciation. But I can tell you based on the 10 to 11 billion CapEx this year, we expect the depreciation will increase by mid-single-digit, which is versus last year was double-digit. So you see, it's all about 10 to 11 billion, but depreciation change can be quite different.

Bill Lu UBS Investment Bank, Research Division - MD and Asia Semiconductors Analyst

Sorry I need to walk through the math a little bit. What is that assuming for, I guess, the 7+? Because I just want to figure out the next couple of years, as EUV ramps up, are we going to see a pickup or how does that work?

Lora Ho Taiwan Semiconductor Manufacturing Company Limited - CFO & Senior VP of Finance

I don't recall there is a sudden increase. It's a more modest increase year-over-year.

Elizabeth Sun Taiwan Semiconductor Manufacturing Company Limited - Senior Director of Corporate Communication Division

All right. I think it's about time that we should go to the line for the questions from analysts waiting in the line.

So operator, could you please have the first caller on the line?

Operator

Yes, the first question is from the line of Brett Simpson from Arete Research.

Brett Simpson Arete Research Services LLP - Senior Analyst

I did have a question on inventory levels. Can you help me frame where the industry inventory levels are at the moment, maybe the inventory days versus a quarter ago? And what would you say is normal inventory levels in inventory days? Can you look exactly how elevated the inventory levels are at the moment?

Elizabeth Sun Taiwan Semiconductor Manufacturing Company Limited - Senior Director of Corporate Communication Division

Brett, I think you probably talk to too close to the microphone, so I'm not hearing you quite well, but I think you are asking the inventory level. The excess inventory that we see it now versus we saw 3 months ago. And you like to have a little bit color on that difference. Is that your question?

Brett Simpson Arete Research Services LLP - Senior Analyst

Yes. I think and also just to understand what normal inventory levels are in your view.

Mark Liu Taiwan Semiconductor Manufacturing Company Limited - Chairman of the Board

Three months ago, we estimate the inventory exiting 2018 is several days above seasonal. Now we look at it more like a 10 days above seasonal.

Brett Simpson Arete Research Services LLP - Senior Analyst

And you said Smartphone seasonality was also going to be weak in Q1. What are you suggesting the communication division revenue in Q1 versus Q4 revenue?

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

Well, I think the main reason is because of high-end smartphone seasonality. So that's a -- and typically, Q1 is a low season for the high-end smartphone. But this kind of high inventory is because of a sudden drop (in demand) from the 4Q last year and extended to the first quarter this year. And that's why the inventory suddenly increase so much. Did that answer your question?

Brett Simpson Arete Research Services LLP - Senior Analyst

Can you help maybe quantify -- thank you. Can you perhaps quantify how big a drop in Q1 your Communication revenue will be because of the Smartphone seasonality?

Mark Liu Taiwan Semiconductor Manufacturing Company Limited - Chairman of the Board

Okay. Lora, would you answer this?

Lora Ho Taiwan Semiconductor Manufacturing Company Limited - CFO & Senior VP of Finance

So you're asking the by segment how do we see the changes in first quarter. Communication in the first quarter will drop the most followed by the computer. Consumer actually will grow slightly and Industrial/Standard will grow (decline) very significant. So I think the decline in 3 sectors are all double-digit decline in the first quarter.

Brett Simpson Arete Research Services LLP - Senior Analyst

And one last question on 7-nanometer, what percent of sales in Q1 do you expect to come from 7-nanometer? And you're suggesting a very strong 7-nanometer ramp in second half when the industry gets back to normal inventory levels. Is there a risk that demand for 7-nanometer exceeds supply? And to what extent can you get customers to pull in 7-nanometer and start ramping earlier in Q2 of this year?

Elizabeth Sun Taiwan Semiconductor Manufacturing Company Limited - Senior Director of Corporate Communication Division

We're trying to understand your question. So you're asking us about 7-nanometer since we said that there's going to be a strong cutback on 7-nanometer. Are you asking what percentage of 7-nanometer is part of our Q1 revenue and then what will be the level in the second half for 7-nanometer?

Mark Liu Taiwan Semiconductor Manufacturing Company Limited - Chairman of the Board

Let me answer. Let me try to clarify the ramping of 7-nanometer this year. We already ramped the 7-nanometer last year and that's our first generation 7-nanometer. Coming to the first quarter, the 7-nanometer composition is about 21% of our corporate revenue already. Now this year, we are preparing to ramp the second generation 7-nanometer. We don't have a specific name, different customer have different flavors. But overall, it's their second generation products to be launched this year. So or the 7-nanometer number for the second generation will be drastically increased during this ramp in the second half of this year.

Brett Simpson Arete Research Services LLP - Senior Analyst

I'm sorry, just to clarify, can you indicate what 7-nanometer as a percent of sales might be in Q1 and does this mark the trough for 7-nanometer in 2019?

Elizabeth Sun Taiwan Semiconductor Manufacturing Company Limited - Senior Director of Corporate Communication Division

Question is what's the percentage of 7-nanometer in our revenue in Q1 and whether or not that percentage is the trough, is the lowest for this year.

Mark Liu Taiwan Semiconductor Manufacturing Company Limited - Chairman of the Board

Lora, can you answer that?

Lora Ho Taiwan Semiconductor Manufacturing Company Limited - CFO & Senior VP of Finance

Okay. Mark just mentioned the 7-nanometer accounts for 21% of our first quarter revenue. We see that percentage of total revenue will continue to grow. So I will say that percentage-wise first quarter will be the trough.

Elizabeth Sun Taiwan Semiconductor Manufacturing Company Limited - Senior Director of Corporate Communication Division

So operator let's go to the next caller on the line.

Operator

Next question is from the line of Mehdi Hosseini from SIG.

Mehdi Hosseini Susquehanna Financial Group, LLLP, Research Division - Senior Analyst

I have 1 follow-up regarding your high-performance compute expectation for 2019. I believe cryptocurrency accounted for only a few of percentage of overall revenues in the first half of '18. So why is there still an overhang on your HPC revenue mix? I believe you said including crypto, it will be -- HPC will be down double digits. And I'm just trying to better understand how it has trended from '18 to '19? And I have a follow-up.

Elizabeth Sun Taiwan Semiconductor Manufacturing Company Limited - Senior Director of Corporate Communication Division

So Mehdi, I think you are asking us about HPC this year, if crypto accounted for a few points of our business in 2018 and how much crypto will be accounting for our business in 2019.

Mehdi Hosseini Susquehanna Financial Group, LLLP, Research Division - Senior Analyst

Yes.

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

Okay. This year, we don't forecast -- we become conservative in forecasting this volatile business. So the cryptocurrency mining this year is much, much less than last year. And to what percentage, I don't think it's -- I can release it right now.

Mark Liu Taiwan Semiconductor Manufacturing Company Limited - Chairman of the Board

It is a conservative -- this is a conservative estimation of cryptocurrency.

Mehdi Hosseini Susquehanna Financial Group, LLLP, Research Division - Senior Analyst

You have a new HPC customer program. How come those ramps are not enabling you to ramp HPC in 2019 rather than just slightly up?



Elizabeth Sun Taiwan Semiconductor Manufacturing Company Limited - Senior Director of Corporate Communication Division

So Mehdi's comments is that if we have this expanding customer portfolio in HPC, why is it that HPC, excluding crypto mining, can only grow slightly this year?

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

All right, good question. It's because of our customer we expand in our customer portfolio and product portfolio. But their ramp will start from probably in the second half this year with the small-volume and then going to the mass production next year. That's why this year, we saw just slightly increase on the HPC business excluding the cryptocurrency.

Mehdi Hosseini Susquehanna Financial Group, LLLP, Research Division - Senior Analyst

And my second follow-up has to do with the 5-nanometer ramp. And I'm trying to better understand your visibility and tapeout engagement. Should we expect a 5-nanometer ramp in 2020 to look more like a 7 or is that going to be a steeper? Any color would be appreciated.

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

Well, let me comment on that. 5-nanometer are ramping in 2020. I would expect that product portfolio is expanding more as compared with the 7-nanometer in 2018. How much of a steeper of that one, it will be similar or probably we're a little bit conservative. But today, we saw the better product portfolio, better customer portfolio. But steeper ramp probably will be similar.

Mehdi Hosseini Susquehanna Financial Group, LLLP, Research Division - Senior Analyst

Sure. Should we assume that 5 would become bigger than 7 in 2021? Is that when the true benefits of 5 and the customer diversification that will materialize?

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

From today's situation and customers we engage with, yes, 2021 5-nanometer will be bigger than the 7-nanometer's same period of time.

Elizabeth Sun Taiwan Semiconductor Manufacturing Company Limited - Senior Director of Corporate Communication Division

All right. Let's come back to the floor.

Next question will be coming from Morgan Stanley's Charlie Chan.

Charlie Chan Morgan Stanley, Research Division - Technology Analyst

So my first question is about smartphone semi-demand for this year because the management attribute the weakness in 1Q to a seasonality. But do you see any structural issues? For example, the lengthier replacement cycle (inaudible) issue of the smartphone semi-demand? And also I can because high-end smartphone, even it's a higher content it should be contributing more for your revenue. But you're assuming this segment will decline and units will decline, right? So why can you get a number that a full year mobile revenue can still grow slightly?

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

Good question. Actually, high-end smartphone this year at least for the first half still have some kind of inventory issue. But in the second half, we expect that new model coming out. It's ramping up starting from the second quarter and all the way to the end of this year with a new model coming out. However, the total units as we expected or we forecasted that what we drop slightly. The content will increase more than the unit drop in the percentage-wise. So TSMC still grow slightly on the mobile business. That's why. And your question is...

Charlie Chan Morgan Stanley, Research Division - Technology Analyst

So I just want to get a confidence why you think second half that recovery could happen, right? Because it's possible that a new product may disappoint again. And also, yes, if I can get more color, do you think it's kind of a specific brand issue or is that across different brands for the high-end smartphone demand issue?

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

All right. Second half, that's a good question also. Second half, why we still expect a recovery, because we have a better customer portfolio. That's all I can say.

Charlie Chan Morgan Stanley, Research Division - Technology Analyst

Okay, fair enough. So market share again there. And also I want to follow-up the previous question regarding HPC, right? So because compared to your previous target to grow 20% year-on-year every year for HPC, I feel like except for crypto there's also some demand issue, right? For example, I'm not sure what you will see the demand in AI cloud and those telecommunication, right? Because that will be some demand issue to get only kind of slightly growth for HPC versus your targets of 20%. Can you comment on the demand?

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

Okay, let me comment on that. We used to be very optimistic. We're still very optimistic because of the AI and 5G. But AI and 5G -- AI is picking up. 5G will start from this second half. Start to install some of the base station, the infrastructure will start to build out. So we did not expect the 5G smartphone will be a big number this year. It will be a big number next year. And all the smartphone we expect that the AI will be included inside with some kind of a content that we did not get the full picture yet but we know is increasing. And you are talking about HPC. We used to say the 20% CAGR. Did we say that?

Charlie Chan Morgan Stanley, Research Division - Technology Analyst

Last year and the year before.

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

Oh no. The last year compared with a year before because there is a 1 uncertain -- not 1 uncertain, 1 surprise that's called cryptocurrency mining. It suddenly increased dramatically. And TSMC because of the technology offering, so we have to say that we are the -- we get most of the benefit of the cryptocurrency's mining business. Now we saw volatility drop. However, without the cryptocurrency, we still see strong momentum on the high-performance computing: one, because we have very competitive or actually I want to say the industry leading technology which fits the requirement of HPC business; second, again, I would have to say we have a stronger customer portfolio.

Charlie Chan Morgan Stanley, Research Division - Technology Analyst

Let's look beyond 2019, right. So for 2 or 3 very high growth profile segment, HPC, IoT and auto, which I was very surprised that your company is only flat year-on-year. So for coming in maybe 2 or 3 years, what do you think should be the right CAGR for HPC, IoT and auto?

Mark Liu Taiwan Semiconductor Manufacturing Company Limited - Chairman of the Board

I think the strongest growth is high-performance computing. The second strong growth in terms of the dollar increase is still smartphone, yes. So that's a dollar increase.

Charlie Chan Morgan Stanley, Research Division - Technology Analyst

But auto includes those kind of EV -- I'm not sure how you classify the autonomous driving, right? But auto I think it used to be kind of a segment the company expects strong growth. Why this year we don't...

Mark Liu Taiwan Semiconductor Manufacturing Company Limited - Chairman of the Board

Yes. Auto if you look at the past 2 years, it's a very strong growth, 27%. But as you know, since last year, suddenly the automotive markets almost stopped growing. Many of our customers say the same thing. Very consistently. And some of them has attributed to the steel and aluminum tariffs. And that is I think is the structure of the automotive. In terms of the long-term, we still see the innovation of automotive will come out of this.

Charlie Chan Morgan Stanley, Research Division - Technology Analyst

So yes, I guess 1 question from a lot of investors it's about dividend payout expectation right, because comment was steady growth every year. But you have had some over the past 2 years EPS growth of around 3% per year and this year, I'm not sure, right. It will be flat, right? So does the company think this year you want to increase the dividend dollars again?

Lora Ho Taiwan Semiconductor Manufacturing Company Limited - CFO & Senior VP of Finance

Despite the short-term market weakness, if we look at free cash flow that we can generate remain very strong. So we plan to further increase dividend in 2019. We will get the board approval in February. So will make announcement after that.

Elizabeth Sun Taiwan Semiconductor Manufacturing Company Limited - Senior Director of Corporate Communication Division

All right. Next question will be coming from JPMorgan's Gokul.

Gokul Hariharan JP Morgan Chase & Co, Research Division - Head of Taiwan Equity Research and Senior Tech Analyst

My first question, could you talk a little bit about any recalibration in the China expansion given what we have seen with cryptocurrency and some the China demand as well? Could you talk about the plans on China expansion? The last time, you mentioned maybe go up to 20k in phase 1 and then potentially expand beyond that. Was there any timeline difference on the Nanjing fab?

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

The plan did not change, because this is so short-term different kind of market softening. No, it did not change our strategy. The plan continues.

Gokul Hariharan JP Morgan Chase & Co, Research Division - Head of Taiwan Equity Research and Senior Tech Analyst

Is there any timing differential in terms of when you get to phase 2 given (inaudible)

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

It will depend on the business situation, definitely. But 20,000 wafer per month is a plan, continue to be executed.

Gokul Hariharan JP Morgan Chase & Co, Research Division - Head of Taiwan Equity Research and Senior Tech Analyst

Okay. Next question I had was on N5. Just building on some of the questions as well. It is for many customers it's going to be the first node with significant EUV insertion. So could you help us understand what is the feedback you're getting from customers. Are customers planning to stay on at N7 longer even N7 has been successfully proven node and as you mentioned a lot more customers are coming through there or do we expect to see the same number of tapeouts like 50 tapeouts that you had by the end of 2017? Are we going to be at similar kind of levels as we get into end of this year? Can you give us some idea about how that progress from our breadth of customer base is progressing in N5?

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

Okay. On the N5 progress, I just reported that our progress is on track and we work with the customers. And you say that whether our customers have worry or concern on EUV's readiness or stability and those kind of things, no, they are happy with us. We worked with supplier, we worked with the customer on both side and our progress is so far, so good. Now whether that they want to move into N5 or stay in the 7, all I say is all the customer who are working with us on N7 are engaging with us at N5. The product, when they want to introduce into the market that is our customer's judgment. Because N5 did offer very good performance per se as compared with N7. So some of the high-speed computing, some of the high-end smartphone, they still need to go into N5. So you would expect those customer will adopt the N5 immediately that when it is available, okay. So number of the tapeouts, I cannot tell you right now. But I already told you that all the customers are engaging with us.

Elizabeth Sun Taiwan Semiconductor Manufacturing Company Limited - Senior Director of Corporate Communication Division

Next question will be coming from Crédit Suisse with Randy Abrams.

Randy Abrams Crédit Suisse AG, Research Division - MD and Head of Taiwan Research in the Equity Research Department

I wanted to follow-up on your guidance for 2019. Last year, you gave a guidance at the beginning of the year for first half year-over-year growth and also the second half year-over-year. So if you could give a view or maybe split how you see in first half versus second half?

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

Lora, can you give the number?

Mark Liu Taiwan Semiconductor Manufacturing Company Limited - Chairman of the Board

Second half definitely is better than first half, okay?

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

That's good, much better.

Lora Ho Taiwan Semiconductor Manufacturing Company Limited - CFO & Senior VP of Finance

First quarter of '19 is quite weak, and we think it's going to take another quarter to recover. So from what I have seen now for this year, if you compare year-over-year, our first half may not be higher, maybe worse than last year. But second half definitely will be better.

Randy Abrams Crédit Suisse AG, Research Division - MD and Head of Taiwan Research in the Equity Research Department

A follow-up on the application and inventory issue, could you talk how broad? Because you did flag smartphone as inventory, but could you flag how broad you think that inventory issue is? Will cross applications in the guidance per product had industrial up significantly, consumer up slightly. If you could talk a bit about that factoring in the inventory comments, what's driving those increases.

Mark Liu Taiwan Semiconductor Manufacturing Company Limited - Chairman of the Board

You mean supply chains inventory?

Randy Abrams Crédit Suisse AG, Research Division - MD and Head of Taiwan Research in the Equity Research Department

Yes, because you mentioned it's a broad inventory or you have an inventory issue. How do see it across the other applications and what's driving the segments.

Mark Liu Taiwan Semiconductor Manufacturing Company Limited - Chairman of the Board

Exiting 2018, I think the inventory increase is broad range, because of the macroeconomic uncertainty in this trade tension. Pretty much put people really on hold very careful. So there's used to be across the board.

Randy Abrams Crédit Suisse AG, Research Division - MD and Head of Taiwan Research in the Equity Research Department

Okay. Then I guess, the rationale then for industrial up significantly and consumer up slightly.

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

Well, I think that the industrial...

Lora Ho Taiwan Semiconductor Manufacturing Company Limited - CFO & Senior VP of Finance

Randy, your question is industrial segment is down in first quarter.

Randy Abrams Crédit Suisse AG, Research Division - MD and Head of Taiwan Research in the Equity Research Department

No, I think you said industrial was up significantly and consumer up slightly (inaudible)

Lora Ho Taiwan Semiconductor Manufacturing Company Limited - CFO & Senior VP of Finance

No, no, I said industrial down significantly. Only consumer up slightly. The other sector all down, okay?

Randy Abrams Crédit Suisse AG, Research Division - MD and Head of Taiwan Research in the Equity Research Department

And if I could squeeze 1 more in the backend, it's still another significant CapEx. Could you talk maybe a snapshot what you expect for the backend business this year and what you're seeing for InFO and CoWoS expansion this year?

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

The backend business is this year it will grow double-digit. Still a very good business because of we offer the solution to the customers so that they can get the higher performance and better cost structure that they can find in other piece?

Mark Liu Taiwan Semiconductor Manufacturing Company Limited - Chairman of the Board

The back-end last year is about 2.5 billion. And going forward, currently, we see the double-digit growth at least year-over-year. To clarify, backend business still is in initial stage because as you remember initially, our backend was adopted by the smartphone. But now more and more, we see the high-performance computing customer in the 5-nanometer. Almost all of them adopt -- wants to adopt what we call advanced packaging. So we see the advanced packaging business is coming to support our high-performance computing products across the leading edge customers. Just to make the record, from now on, we call -- we don't call backend. We call that advanced packaging because we realize that packaging is very different than the OSAT business we used to know.

Elizabeth Sun Taiwan Semiconductor Manufacturing Company Limited - Senior Director of Corporate Communication Division

Follow-up question from CL Securities, Sebastian Hou.

Sebastian Hou CL Securities Taiwan Company Limited, Research Division - Research Analyst

First follow-up is can you provide us some update on the tapeout numbers that you have received on 5-nanometers now or your expectation by the end of this year?

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

Well, I just say that I cannot give you the numbers today. But I repeat it again, all the 7-nanometer customers are working with us right now on their designed.

Sebastian Hou CL Securities Taiwan Company Limited, Research Division - Research Analyst

Okay. And the 7-nanometer tapeout number still on track to exceed 100 by the end of this year?

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

It's still.

Sebastian Hou CL Securities Taiwan Company Limited, Research Division - Research Analyst

Or it could be earlier?

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

Well, it will depend on how quickly that our customer can adopt our N7, N7+. But still, the numbers still meet our expectations on the HPC probably even more higher, yes.

Sebastian Hou CL Securities Taiwan Company Limited, Research Division - Research Analyst

And given the current macro uncertainty, have you noticed any of your customers which are during the tapeout on 7 right now, become more hesitant or cautious in terms of the production schedule?

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

No, they are being very aggressive because of 7-nanometer has very good performance. So they can sell them to gain the market -- to their product going to the market. So it's not slowing down. It's actually accelerating a little bit.

Sebastian Hou CL Securities Taiwan Company Limited, Research Division - Research Analyst

Okay. So I think last year and this year, I think probably only not a big portion of these 7-nanometer tapeout with customers are reaching production. Is that a fair assumption? Just...

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

Yes.

Sebastian Hou CL Securities Taiwan Company Limited, Research Division - Research Analyst

Just one of the big customers account for big wafer volume but the tapeout number is small. Which means do you expect more of this smaller volume type customers but to get account of the big numbers of the tapeout will reach production in 2020.

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

Well, I just mentioned yes, some of the second wave or third wave of product design get into the 7, 7+ will start to ramp probably second half or the fourth quarter of this year. Mass production will be expected in 2020.

Sebastian Hou CL Securities Taiwan Company Limited, Research Division - Research Analyst

Okay. So it sounds like you don't notice or feel any bubbling in terms of the tapeout booming.

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

No we did not see that.

Sebastian Hou CL Securities Taiwan Company Limited, Research Division - Research Analyst

Okay, it's great. My next question is -- sorry, I won't have another question.

Elizabeth Sun Taiwan Semiconductor Manufacturing Company Limited - Senior Director of Corporate Communication Division

Okay. The right, follow-up questions from Citi's Roland Shu.

Roland Shu Citigroup Inc, Research Division - Director and Head of Regional Semiconductor Research

Last year, the raw wafer negatively impacted gross margin. How about this year? Are we going to still see the same change or we happen to see will be reversed maybe a benefit for this raw wafer price on margin?

Lora Ho Taiwan Semiconductor Manufacturing Company Limited - CFO & Senior VP of Finance

We have signed a long-term contract with our suppliers in 2017 and '18. So lock in the long-term supply and also lock in the price. So we do not see any further price deterioration for us, yes.

Roland Shu Citigroup Inc, Research Division - Director and Head of Regional Semiconductor Research

Okay, yes but given now that demand is declining and are we going to renegotiate these longer contracts with the wafer suppliers?

Mark Liu Taiwan Semiconductor Manufacturing Company Limited - Chairman of the Board

Yes.

Roland Shu Citigroup Inc, Research Division - Director and Head of Regional Semiconductor Research

So this is for 2019 and 2020 or going forward?

Mark Liu Taiwan Semiconductor Manufacturing Company Limited - Chairman of the Board

Going forward. Going forward, we hope we achieve some cost saving.

Roland Shu Citigroup Inc, Research Division - Director and Head of Regional Semiconductor Research

Second question is by when you will see your CPU revenue to reach 1% of your total revenue and also by when you will see the CPU foundry also coming from multiple customers?

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

That's some very specific 1% but just say that we started working with the CPU customers and starting from 7, 7+ and all the way to 5, okay? And when time's up I'll report it here, say what is percentage that we got from the CPU, okay.

Mark Liu Taiwan Semiconductor Manufacturing Company Limited - Chairman of the Board

I think you can calculate from our customers' financial.

Roland Shu Citigroup Inc, Research Division - Director and Head of Regional Semiconductor Research

Okay. Just to clarify, C.C, you said that you start to work with a CPU customer or customers.

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

Customers.

Elizabeth Sun Taiwan Semiconductor Manufacturing Company Limited - Senior Director of Corporate Communication Division

All right. Next question will be coming from UBS is Bill Lu.

Bill Lu UBS Investment Bank, Research Division - MD and Asia Semiconductors Analyst

A couple of questions on the trade tension in tariffs. With tariffs becoming, I guess more prevalent, does that change your outlook on where to place the fabs? And secondly, you've got more competition at the trailing edge if you look at the Chinese fabs. Are you seeing an opportunity to for it to take share with the trade tension?

Mark Liu Taiwan Semiconductor Manufacturing Company Limited - Chairman of the Board

Okay. You talked about fab location, right? It is -- as you know, we have -- when we build fab, nowadays we only build the leading edge fabs. That is we're doing 5-nanometer fabs, preparation and we're building 3-nanometer. And the decision was made to build in Tainan, okay? And of course, with across-the-board support from the local and administration here. Upon the trade tension, I think it appears that we will, at this point, it seems that there are much -- it is good to build a fab in Taiwan. But actually, we have almost none request from our customers to change the plan we have. We -- but however we do constantly assessing and deliberation about what's the pros and cons of that plan and whether there are other options. But so far, we haven't changed our plan. The prime reason is this: When we ramp the leading edge fabs, as you know those are really for the high-performance computing or smartphone launch, the ramp is very tight. Time-to-market is critical. And to have a leading edge fab ramp not only this fab has to be closely coupled with an R&D fab, which is in Hsinchu, the 2 teams also work as 1 team, also this fab has to collaborate with other fabs in TSMC. As our founder mentioned, there are thousands of engineers, transport from fab to fab to cope with this sudden ramp of those resources needed. So those are the background of those leading edge fabs. When we open book with our customers, this is the best sure way to ensure their product announcement and product launch and the request conversation will take them back. But we're constantly watching this on bigger geopolitical change. Of course, at this present time, we do not have plan to change that.

Bill Lu UBS Investment Bank, Research Division - MD and Asia Semiconductors Analyst

The second part of the question is are you seeing an opportunity to take share, for example? A few of our customers don't want to use Chinese fabs?

Mark Liu Taiwan Semiconductor Manufacturing Company Limited - Chairman of the Board

The question is say that again?

Bill Lu UBS Investment Bank, Research Division - MD and Asia Semiconductors Analyst

Is there an opportunity at the trailing edge 28-nanometer, 8 inch to take market share?

Mark Liu Taiwan Semiconductor Manufacturing Company Limited - Chairman of the Board

From Chinese Fab?

Elizabeth Sun Taiwan Semiconductor Manufacturing Company Limited - Senior Director of Corporate Communication Division

(inaudible)

Mark Liu Taiwan Semiconductor Manufacturing Company Limited - Chairman of the Board

Well, most of the U.S. customer -- currently, the Chinese Fab is still not used by the local customers, when you put it this way. Intention of the other U.S. customer, we didn't encounter those comments.

Elizabeth Sun Taiwan Semiconductor Manufacturing Company Limited - Senior Director of Corporate Communication Division

All right. Follow-up questions coming from Morgan Stanley's Charlie -- Charlie Chan.

Charlie Chan Morgan Stanley, Research Division - Technology Analyst

Yes. So I want to follow up a little bit about the trade tension issue because another topic is Huawei's 5G and information security issue. So how does the company kind of evaluate this kind of business risk? I mean exposure to Huawei's supply chain and have you got any concern from governments or U.S. governments on this topic.

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

No, and we are everybody's foundry. And we did not see any kind of instruction or information from the government so business as usual.

Charlie Chan Morgan Stanley, Research Division - Technology Analyst

And also, another question is regarding your specialty semiconductor strategy. As you mentioned, you want to build up a new 8" fab in Tainan. I would guess is for lots of niche demand. But how do you deal with this kind of outsourcing or partnership with your subsidiary Vanguard going forward in the 8-inch business?

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

Well, if you look at the market, 8 inch as a business that is actually some time the capacity is in shortage. But regardless of Vanguard or not, TSMC did not increase the capacity. We increased the specialties capability and also our service to the customer. So we built the new building to give more room to put the specialty tool inside to support our customer.

Charlie Chan Morgan Stanley, Research Division - Technology Analyst

Okay, okay. And that's the -- I guess, this year could be tough, right, could be the first downturn that 2 gentlemen become the new management, right? So is there any initiative that you want to take the company, get through this potential downturn? Any new initiatives in the company?

C. C. Wei Taiwan Semiconductor Manufacturing Company Limited - CEO & Vice Chairman

Why do you say this is a new management? We have been here for more than 20 years at least. The new measure -- I mean, that's -- we follow a very good guidance from the previous chairman. And so far, so good. The strategy continues, the management style continues. So new management, hard to say.

Charlie Chan Morgan Stanley, Research Division - Technology Analyst

Sorry for the phrasing, sorry.

Mark Liu Taiwan Semiconductor Manufacturing Company Limited - Chairman of the Board

Let me comment. This is -- we, over the years, I mean, right now, probably is the -- in terms of technology portfolio TSMC has built, both leading edge and specialty, I think this is the strongest position at present time. Do you agree? And also about the customer engagement or customer portfolio, this time, it's about the widest customer portfolio we ever have. And C.C. is talking about getting into high-performance computing even the CPUs, including data center CPU, accelerators and the client CPUs. It's probably the widest addressable market we ever have. So we're going to continue these 3 thrusts. We're going to invest further on the R&D and we're going to continue to engage with our customers' design, closely building the team. Actually we sent people to our customers to build the design of 5-nanometer some of the 3-nanometer discussion. And also, we just want the high-performance computing can adopt our technology development features more tightly. So we think this is a -- although we're facing some headwinds on the macroeconomy and just another uncertainty is not our control. It's the trade dispute tension, we just hope the 2 country can come to a win-win or at least not lose-lose solution. I think we're on the road to the -- to climb our next peak, yes.

Elizabeth Sun Taiwan Semiconductor Manufacturing Company Limited - Senior Director of Corporate Communication Division

With TSMC's business under the steady stable hands and the expanding addressable market, we will conclude today's conference.

So please be advised that the replay of the conference will be accessible within 4 hours from now. The transcript will become available 24 hours from now, both of which will be available through our website at www.tsmc.com.

Thank you for joining us today. We hope you will join us again next quarter. Goodbye, and have a good day.

Mark Liu *Taiwan Semiconductor Manufacturing Company Limited - Chairman of the Board*

Thank you. Thank you very much.

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