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Earnings Call

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## OVERVIEW:

Co. reported 2016 revenues of TWD948b and EPS of TWD12.89. 4Q16 revenue was TWD262b and EPS was TWD3.86. Expects 1Q17 revenues (based on certain items) to be TWD236-239b.



## CORPORATE PARTICIPANTS

**Elizabeth Sun** *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

**Lora Ho** *Taiwan Semiconductor Manufacturing Company Ltd - SVP, CFO*

**Morris Chang** *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

**C.C. Wei** *Taiwan Semiconductor Manufacturing Company Ltd - President and Co-CEO*

**Mark Liu** *Taiwan Semiconductor Manufacturing Company Ltd - President and Co-CEO*

## CONFERENCE CALL PARTICIPANTS

**Michael Chou** *Deutsche Bank - Analyst*

**Randy Abrams** *Credit Suisse - Analyst*

**Bill Lu** *UBS Securities - Analyst*

**Charlie Chan** *Morgan Stanley - Analyst*

**Roland Shu** *Citigroup Global Markets - Analyst*

**Brett Simpson** *Arete - Analyst*

**Donald Lu** *Goldman Sachs - Analyst*

**Rick Hsu** *Daiwa Capital Markets - Analyst*

**Steven Pelayo** *HSBC - Analyst*

**Sebastian Hou** *Credit Lyonnais - Analyst*

**Mehdi Hosseini** *Susquehanna Financial Group - Analyst*

## PRESENTATION

**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

Happy New Year, everyone. Welcome to TSMC's fourth quarter 2016 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](http://www.tsmc.com). If you are joining us via the conference call, your dial-in lines are in listen-only mode. As this 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 of 2016 followed by our guidance for the first quarter of 2017. Afterwards, TSMC's chairman, Dr. Morris Chang, will provide our key messages and conduct the Q&A session where TSMC's two presidents and co-CEOs, Dr. Mark Liu, and Dr. CC Wei, will be joining Chairman Chang and Ms. Ho in answering your questions.

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

As usual, I would like to remind everybody 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 on our press release.



Now, I would like to turn the podium to TSMC's CFO, Ms. Lora Ho, with the summary of operations and current quarter guidance.

**Lora Ho** - *Taiwan Semiconductor Manufacturing Company Ltd - SVP, CFO*

Good afternoon, you hear me okay? Okay.

Thank you for joining us today. My presentation will start with financial highlights for the fourth quarter, the recap of our 2016 performance, followed by the guidance of the current quarter.

Fourth quarter revenue rose 0.7% sequentially to TWD262 billion, exceeding the high end of our guidance given in October due to a stronger demand for TSMC's 16 nanometer technology and the more favorable foreign exchange rate than our original forecast. Gross margin increased by 1.6 percentage point quarter-over-quarter to 52.3%, mainly driven by continued cost improvement efforts. Operating margin also increased at 1.1 percentage point sequentially to 41.9%, while R&D expense continued to grow, reflecting a higher level of 7 nanometer and 10 nanometer development activities.

Overall, our fourth quarter EPS reached TWD3.86, and ROE was 30% for the quarter.

Now, let's take a look at wafer revenue contribution by application. During the fourth quarter, communication and computer increased 11% and 7% on the prior quarter respectively while consumer and industrial standard decreased by 43% and 6% respectively.

On full year basis, all four segments experienced year-on-year growth. Communication increased 16% YoY and represented 62% of our total wafer revenue, the computer increased 15%, consumer grew 32%, industrial/standard rose 1%.

Now, let us take a look at the revenue by technology. Combined revenue from 16 nanometer and 20 nanometer reached 33% of wafer revenues in the fourth quarter, up from 31% in the third quarter. Our 28 nanometer contribution remains strong at 24% of revenue. Advanced technology, meaning 28 nanometer and below, accounted for 57% of total wafer revenue in the fourth quarter.

On a full year basis, the combined 16/20 nanometer contribution increased by 8 percentage points, and reached 28% of total wafer revenue in 2016. Advanced technologies, 28 nanometer and below, accounted for 54% of total wafer revenue, up from 48% in 2015.

Moving on to the balance sheet, we ended the fourth quarter with cash and marketable securities of TWD632 billion, an increase of TWD115 billion. On the liability side, current liabilities increased by TWD61 billion. On the financial ratios, accounts receivable turnover days increased three days to 45 days. For inventory, our days of inventory decreased three days to 41 days, mainly driven by the reduction of work-in-process.

Now let me make a few comments on cash flow and CapEx. During the fourth quarter, we generated about TWD185 billion cash from operations, and spent TWD113 billion in capital expenditure. As a result, we generated free cash flow of TWD73 billion and our overall cash balance increased TWD77 billion, to reach TWD541 billion at the end of the quarter.

In US dollar terms, our fourth quarter capital expenditure reached \$3.5 billion and the total year CapEx was \$10.2 billion. This is a bit higher than our prior guidance of slightly above \$9.5 billion, mainly due to accelerated delivery of advanced technology tools.

Now, I would like to give you a recap of our performance in 2016. 2016 was a good year for TSMC as once again, we set new records in terms of revenue and earnings. Our revenue grew 12.4% year-over-year, and reached TWD948 billion, or up 10.6% to \$29.4 billion in US dollar term. As a result, wafer shipment increased across nearly all technology nodes.

Gross margin increased 1.4 percentage points to 50.1% in 2016, mainly due to continued cost reduction efforts and to a lesser extent, the more favorable foreign exchange rate. Our operating margin also increased 2 percentage points to reach 39.9%. Our effective tax rate was 13.5% in 2016, same as in 2015 and full year earnings per share was TWD12.89, an increase of 9% year-over-year. Excluding major one off items, namely share

disposal gains and a closure of our Solar operations in 2015, and the negative impact from the earthquake in 2016, our EPS would have grown 17.4% year-over-year in 2016.

On cash flow, we spent TWD328 billion in capital expenditure. While we generated TWD540 billion in operating cash flow, and TWD212 billion in free cash flow. We also paid TWD156 billion in cash dividend, an increase of 33% from the 2015.

From a semiconductor industry standpoint, we estimate that the semiconductor market is likely to have remained flat year-on-year. While fabless grew 5% and foundry rose 8%, the outperformance of foundry over the overall semiconductor industry was mainly driven by the strong demand from 4G powered smartphones in the China market, the replacement upgrade of gaming and emergence of artificial intelligence.

Compared to foundry's 8% growth, TSMC's 11% growth in US dollar underscore our further market segment share gain of 55% in 2015 to 56% in 2016, which is mainly propelled by our leadership in 16 nanometer and 20 nanometer.

We estimated fabless days of inventory ended 2016 at slightly above seasonal level by about two days.

I have finished my remark on the financial summary, now let me turn on to the first quarter outlook.

Moving on to the first quarter 2017, we forecast the demand is weaker than the prior quarter due to mobile product seasonality and slightly above seasonal supply chain inventory at the end of 2016.

Based on our current forecast an exchange rate assumption of \$1 to TWD32, we expect the first quarter revenue to be between TWD236 billion and TWD239 billion, which represents 8.9% to 10% sequential decline.

Gross profit margins will be between 51.5% and 53.5%, and operating margin will be between 40.5% and 42.5%.

This concludes my remarks.

Now, I would like to turn the podium to the chairman for his comments.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Ladies and gentlemen, I first want to wish you a very happy, care free, healthy, and profitable, and hopeful new year. And Lora has just given her report on the last quarter and also she gave her outlook for the first quarter. I will just spend a few minutes to talk about 2017, the whole year.

For 2017, we expect smartphone unit growth of 6%, from 1.47 billion units to 1.55 billion units. Of this smartphone growth, we expect the high end of smartphone will grow 3%, the mid end will grow 5% and the low end will grow 8%. For 2017, we also expect that PC units will decline 5%, tablets will decline 7%, DCE units will decline 5%, and IOT units will grow 34%.

Again, for 2017, we expect semiconductor market will grow 4%, foundry revenue will grow 7%. We expect TSMC revenue will grow 5% to 10% in US dollars. TSMC revenue, we expect to grow 5% to 10% in US dollars.

We believe that in the first half of 2017, our growth over the same period last year will be close to 10% [based on NT dollar](corrected by company after the call). And in the second half of 2017, our growth over the same period last year will be close to 5% [based on NT dollar] (corrected by company after the call). We expect to continue to increase our R&D investments both in dollars and moderately in its percent of revenue. We also reaffirm our long-term growth projection which was made a couple of years ago. We think that in the 2015 to 2020 time period, TSMC revenue and operating profit will grow at a compound annual average rate of 5% to 10%, I'm sorry, 5% to 10%. And TSMC will maintain an ROE of above 20%.

That concludes my outlook for 2017 and I believe we are now open for questions.



## QUESTIONS AND ANSWERS

**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

So this concludes our prepared statements. Before we begin the Q&A session, I would like to remind everybody to limit your questions to two at a time to allow all participants an opportunity to ask questions. Questions will be taken both from the floor and from the line, and should you wish to raise your question in Chinese, I will translate it to English before our management answers your questions.

For those of you on the call, if you would like to ask a question, please press the star, then one, on your telephone keypad. Now, star and one.

Questions will be taken in the order in which they were received. If at any time you would like to remove yourself from the questioning queue, please press the pound or the hash key.

Now, we will start the Q&A session. First, we will have Deutsche Bank, Michael Chou.

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**Michael Chou** - *Deutsche Bank - Analyst*

Hi, Chairman, Co-CEOs, CFO, and Dr. Chang. My first question is regarding the outlook in the first half, given Q1 could be down 8% to 10% so in your guidance for the first half to be up 10% year-on-year. So does that imply you still expect your (inaudible) or we can say sequential growth for Q2 or Q3 going forward.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Maybe I will take the question.

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

Right. Michael, you are asking what is going to be our Q2 and Q3 sequential growth QoQ.

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**Michael Chou** - *Deutsche Bank - Analyst*

Assuming not the --

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

What is the question, repeat the question?

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

You are asking us about the second quarter and third quarter quarter-over-quarter revenue growth outlook?

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

We expect it to be a very significant positive number. [referring to 3Q over 2Q only](corrected by company after the call).

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**Michael Chou** - *Deutsche Bank - Analyst*

So maybe a follow up question for inventory. Given the Q1 outlook seems to be slightly below our estimate, so do you see the demand outlook for Q1 is weaker than you expected three months ago?

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Did you hear the question, Lora?

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**Lora Ho** - *Taiwan Semiconductor Manufacturing Company Ltd - SVP, CFO*

Michael was asking, do we see the Q1 as weaker than we anticipated three months ago.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Lora, will you -- could you answer?

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**Lora Ho** - *Taiwan Semiconductor Manufacturing Company Ltd - SVP, CFO*

Yes, it was weaker than we have anticipated a couple of months ago.

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**Michael Chou** - *Deutsche Bank - Analyst*

But could you specify which segment or what kind of applications?

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**Lora Ho** - *Taiwan Semiconductor Manufacturing Company Ltd - SVP, CFO*

Basically, it's mobile products as we have stated in the press release.

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**Michael Chou** - *Deutsche Bank - Analyst*

Okay.

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

All right. Now the question will go to Credit Suisse, Randy Abrams.

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**Randy Abrams** - *Credit Suisse - Analyst*

Yes, thank you. The first question, I wanted to ask your outlook is more in line with the industry where you are guiding 5% to 10% for foundry near similar levels. Could you talk about the factors to be more inline after gaining the last few years. And can you also address the China business, we are seeing the China foundries grow faster. SMIC is growing 20% to 30%, how does TSMC combat or defend share more on the mature nodes, where they're starting to grow faster?

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Can you repeat the question?

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

All right, Randy, your first question is made with respect to TSMC's 2017 growth outlook, where the chairman has just mentioned that 5% to 10%, which is very much in line with the semiconductor industry.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

With the fab -- I'm sorry, with the foundry industry, yes.

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

So he would like to know the underlying reasons why we are only growing sort of in line with the foundry.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Why we are only in line with the foundry?

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

And then China, where the Chinese foundry appear to be growing faster than the foundry industry and what is going to be our strategy in defending our market share or growing -- competing against them?

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Well, yes, I think that -- I really don't know how fast the Chinese foundries are going to grow but I do agree that their ambition is certainly to grow faster than the foundry average. Now, as to why we are only -- why I put -- projected just now that we are only going to grow the same rate as the foundry growth. Well, first of all, we may well be conservative, it's a little too early to say because I said it's now in answer to this gentleman's question that -- actually, I said when I was giving the message, that the second half -- the first half year-over-year will be 10% -- about 10% growth. And the second half will be around 5%, and well, you know, the second half is farther away again, but that always makes it more difficult to predict and rather than erring on the high side, we would rather err on the low side.

So that is the first reason.

And there is another reason, that is -- this year, I think 2017 will be pretty strong in terms of technology, it will be a pretty strong 16 or 14 FinFET year, and our market share in 16, while it's quite high, is not as high as I would like, it's actually close to 70% or 65% to 70%. Now that is not quite as high as our 28 nanometer, which even now, you know, like almost 80% and now, 2017 is -- I think it's a pretty -- we think will be a pretty strong year.

And so we are running into a little air pocket here, if you call this staying par with the rest of the foundry air pockets, we call that an air pocket, well, we are running into a little air pocket. But then, the next steps, after of course is the 10 and 7 now. We see clear sky, we see clear sky anyway there. So those two reasons. First, possible a little conservatism, and second, there's a little concern, that our 16 does not have as high a market share as I like, as I would like, and 2017 happens to be a very strong, we think, a very strong 16 FinFET year.



Now, having said all of that, I will say that we certainly do not think we will lose market share. So, why I said that foundry will grow at 7% and we are going to grow at between 5% and 10%, which was further clarified that statement by saying that we're going to grow -- we're not going to grow less than foundry. Yes.

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**Randy Abrams** - *Credit Suisse - Analyst*

A quick follow-up, if you plan introduce a 12-nanometer to enhance your 16, if you have plans for that.

And then the second question I had was on profitability. Margins are holding up quite well in the first quarter, where normally utilization drops, it should fall a few points. So if you could talk about the factors holding it up. And then as we move through the year, how the expectation from that level, factoring we're ramping 10 nanometer, if you expect margin to improve from that level.

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

So, Randy, your second question actually has two separate questions, so, yes. First part of your second question is with respect to 12 nanometer and second question of the second question is with respect to the margin profile over this year.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

First question is what?

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

With 12 nanometers.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

12 nanometers. I think that, C.C., will you answer the first question?

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**C.C. Wei** - *Taiwan Semiconductor Manufacturing Company Ltd - President and Co-CEO*

Let me answer the question. You're asking about the 12 nanometer on what?

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**Randy Abrams** - *Credit Suisse - Analyst*

Yes, if TSMC has a strategy or plan to introduce an in-between 12 nanometer to protect share on the FinFET for customers not going to 10 or 7?

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**C.C. Wei** - *Taiwan Semiconductor Manufacturing Company Ltd - President and Co-CEO*

Okay. In fact, we -- our strategy is continuously to improve every node in the performance, such as 28 nanometer. And we continue to improving the 16 nanometers technology. And we have some very good progress, and you might call it the 12 nanometer because we're improving in the density, logic density, performance and power consumption. Yes, we have that.



**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

The second question is the profile of the gross --

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

Gross margin profile.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

We -- I think it will be fairly constant. I think in the second half 10 nanometer, because the 10 nanometer will be ramping up very strongly in the second half, will start to ramp in the first quarter, but it will ramp very strongly in the second half. And the big volume, for the year, of 10 nanometer is going to be in the second half. And the 10 nanometer will drag down the corporate margin in the second half by about 2 points. Now if you take that into consideration, then I would say that our structural profitability will be maintained. And by that I mean something in the 50% range. But take into consideration that in the second half 10 nanometer will drag down the corporate margin, corporate average, by about 2 points. Yes.

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

Okay. Next question will be coming from UBS, Bill Lu.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Bill. Yes.

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**Bill Lu** - *UBS Securities - Analyst*

Hi, thank you and happy new year. Dr. Chang gave us the outlook for the various end-markets in 2017. Can you talk about your outlook for the HPC market as well in 2017? Maybe units is not the right way, but just in terms of the opportunity for TSMC.

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

So our outlook for high-performance computing in 2017, what is going to be the growth outlook for HPC in this year.

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**Mark Liu** - *Taiwan Semiconductor Manufacturing Company Ltd - President and Co-CEO*

Okay. The HPC, high-performance compute, let me define that first. It covers server, infrastructure networking, machine learning, gaming, AR and VR. We see some other AI products who surface but we cannot estimate it. It is just too early to estimate it.

Of course, this year you have seen the gaming AR/VR product starting to ramp. And this is a very new growth area and we see double-digit growth in the beginning. By the way, we -- currently, we have a strong share in the networking infrastructure and gaming already. And it's those other areas is coming to the plate for TSMC. So you can see -- this year you see a before-the-threshold kind of growth and there is a double-digit growth only, mostly in the product development phase.

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**Bill Lu** - *UBS Securities - Analyst*

If I can sneak in a question, 1-B, if you look at the GPU, how do you categorize it? Maybe this is for Lora. Historically it's really for PCs, but going forward as it is used in autos and AI, are you going to put it in computers, for industrials, or how do you categorize that?

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**Mark Liu** - *Taiwan Semiconductor Manufacturing Company Ltd - President and Co-CEO*

GPU for graphics, we put it in the PC. GPU for the server accelerator, we'll put in the HPC, high-performance computing.

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**Bill Lu** - *UBS Securities - Analyst*

My second question is on capital spending. 2016 was a little bit higher than expected. What's the outlook for CapEx in 2017?

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**Lora Ho** - *Taiwan Semiconductor Manufacturing Company Ltd - SVP, CFO*

2017 CapEx will be about \$10 billion.

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

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

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**Charlie Chan** - *Morgan Stanley - Analyst*

Thanks for taking my question. My first question is regarding the advisory report to the US President last Friday, because in a report, the US seems want to ensure their semiconductor leadership, especially in leading-edge, so what will be TSMC's strategy to fit in this policy direction and ensure your own leadership? Thanks.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

You are referring to the advisory, the working -- actually I think it's the working group. And that report was written to President Obama. And there'll be a new President in a few days. And whether any of that report will be adopted as policy by the new President is still unknown.

But having said all that, I will say that Mr. Trump, President-Elect Trump, has said many times that he wants to create jobs in the United States. And we highly applaud that. TSMC actually has created, we believe, hundreds of thousands of jobs in the United States in the last 20-30 years of our existence. We -- for all practical purposes, we have created an industry, the fabless industry, in the United States, and we have grown it, and the fabless industry, I believe, employs hundreds of thousands of people in the United States. And we have done that by being here ourselves. So I think that we'll continue to create more jobs in the United States by helping the fabless industry in the United States. And the IDMs, they use us, there are many IDMs in the United States that use us. And by using us, they have grown faster. And they create jobs too.

So now I -- as to -- I mean that's -- actually, of course, Mr. Trump's main policy to create jobs and of course he has said a lot of things about other things, all right, and I don't want to comment on them right now. As far as that report is concerned, yes, in fact, I think the report was preceded by the Commerce Secretary in the United States, Penny -- will somebody help me? Penny --?

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**Mark Liu** - *Taiwan Semiconductor Manufacturing Company Ltd - President and Co-CEO*

Pritzker.



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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Yes. And I think that I agree with most of the things, but -- I agree with most of the things in the report, in fact, I agree with most of the things that Penny said, but let's keep in mind that that report was written to President Obama.

And, you know, and actually, even if President Obama continues in office, I mean the chance of his adopting the recommendations of a presidential task force are not very high. I mean, we have history to guide us. In fact, just tell you an anecdote, in 2006 I met President Bush, then President of the United States, and at that time his, President Bush's, task force, advisory task force on Iraq, had just submitted a report basically recommended the US withdrawing from Iraq. And President Bush did not adopt the recommendation. He actually adopted the contrary, which was to increase his troops in Iraq. So I mean that's just an example that quickly came to my mind, when somebody talks about, ah, a report has been written. No.

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**Charlie Chan** - *Morgan Stanley - Analyst*

Thanks, Chairman. This is very insightful.

So my next question is to Lora because it's a more maintenance financial question. So your first quarter gross margin guidance seems to be similar to your first quarter, but your revenue scale is down like almost 5%. So, why the gross margin is improving in first quarter? And can you give us guidance about depreciation as well?

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**Lora Ho** - *Taiwan Semiconductor Manufacturing Company Ltd - SVP, CFO*

We still have pretty big volume on 16 nanometer, the profit's improving, and 28 nanometer still accounts for a big part of our revenue this year, with very good profit. And we continue to do the cost reduction, so we can maintain a pretty good margin despite of decline in revenue in the first quarter, that's the reason.

Your second question asked about depreciation for the whole year. Okay, with the \$10 billion CapEx in 2017, which will be slightly frontend-loaded by the way, so the depreciation year over year we expect to grow about high teens this year versus last year.

In terms of first quarter, since last year's CapEx was very much back-end loaded, we expect a more than 10% depreciation increase quarter-over-quarter in the first quarter.

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

Operator, please proceed with the first caller on the line.

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**Operator**

Certainly. The question comes from the line of Roland Shu of Citigroup. Please go ahead.

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**Roland Shu** - *Citigroup Global Markets - Analyst*

Hi, good afternoon. Can you hear me?

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

Yes, I can. We can.



**Roland Shu** - *Citigroup Global Markets - Analyst*

Okay. Thanks for taking my question. First question, I just would like to ask about recently there is a 12-inch wafer price hike. So, would like to ask, what's the impact to the overall gross margin and how long do you think this 12-inch wafer supply and demand imbalance will last? Thank you.

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

I think I will repeat Roland's question here. He's asking us about the recent raw wafer price increase. What's the impact of the raw wafer price increase on our gross margin and how long do we expect the supply/demand imbalance in the raw wafer supply to last?

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Lora?

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**Lora Ho** - *Taiwan Semiconductor Manufacturing Company Ltd - SVP, CFO*

The reason for the wafer price increase is because the imbalanced supply/demand situation, so it's more demand than supplies, and manufacturer were trying to reduce the loss or make more profit. So we anticipate some increase in raw wafer price.

In terms of the impact to TSMC, for this year we expect impact will be about 0.2% of our gross margin. Not very big but it's not very small either.

In terms of when the situation -- sorry?

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**Roland Shu** - *Citigroup Global Markets - Analyst*

Yes, yes, sorry. Continue. Sorry. Yes.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Let me just answer very simply. I mean, we do buy a lot of things and we have a lot of price -- every year, every year, we have a lot of price increases, and we have also a lot of price reductions from our vendors. And what we do, and I think we do it well, is to try to improve in the past five, six, seven years, improve our structural profitability to the present point. And what we're going to do from now on is at least to maintain that level of structural profitability. And to manage that requires taking a lot of things into account, including, you know, price increase there, price reduction there, cost reduction here, cost reduction there, et cetera, et cetera.

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**Roland Shu** - *Citigroup Global Markets - Analyst*

Understood, yes. I know there is very limited impact to TSMC. Okay, thank you.

My second question is, your 8-inch revenue declined by double-digits year-on-year last year, despite overall revenue increased by 11% in US dollars last year. So, I would like to ask, where did this 8-inch weakness come from? And how does it look for this year?

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

So, Roland is asking, last year, 2016, our overall revenue go up by 11% but our 8-inch wafer revenue declined double-digits. What causes such weaknesses? Secondly, what do you think this year is going to happen, whether or not our 8-inch weakness will persist to this year?

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**Roland Shu** - *Citigroup Global Markets - Analyst*

Yes, thank you.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

C.C., will you --

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**C.C. Wei** - *Taiwan Semiconductor Manufacturing Company Ltd - President and Co-CEO*

Okay. Last year, our 8-inch wafer business decreased close to double-digit, mainly because of a lot of products moving into 12-inch wafer. One of the examples is the fingerprint sensor; we have customers moving from 8-inch wafer to 12-inch wafer. And so this kind of a trend will continue. We expect this year will still decrease slightly, but then we have also do a lot of activities to increase our applications in the 8-inch wafer technology, so the decreasing will be much more minimized as compared with last year.

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**Roland Shu** - *Citigroup Global Markets - Analyst*

Okay. So, can we expect the utilization for 8-inch will be much lower than previous, this year?

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**C.C. Wei** - *Taiwan Semiconductor Manufacturing Company Ltd - President and Co-CEO*

The utilization will be closely the same or a little bit above as compared with the last year.

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**Roland Shu** - *Citigroup Global Markets - Analyst*

Okay, understood. Okay, thank you.

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

All right, let's have the next caller on the line please.

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**Operator**

Next question is from the line of Brett Simpson from Arete. Please go ahead.

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**Brett Simpson** - *Arete - Analyst*

Thanks very much. Dr. Chang, you mentioned 10 nanometer and 7 nanometer was clear sky from a competitive perspective. Just interested, if you look at peak capacity for 7 nanometer in wafer terms, will this be a bigger node for TSMC than 28 nanometer? Thank you.



**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

Brett, let me see if I get your question correct. You're asking us whether or not 10 nanometer and 7 nanometer will be bigger than 28 nanometer eventually, is that your question?

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**Brett Simpson** - *Arete - Analyst*

In wafer terms, yes.

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

In wafer counts.

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**Brett Simpson** - *Arete - Analyst*

Yes.

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

In business, in revenue, as well as in wafer counts, you are asking too much. We'll only answer one of the two, yes.

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**Brett Simpson** - *Arete - Analyst*

Only wafer terms.

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

Only wafer counts, okay.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Of 10 and 7, is that right?

10 and 7 wafer count will be slightly less than 28, slightly.

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**Brett Simpson** - *Arete - Analyst*

Okay, that's helpful.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

But the revenue will be much bigger. Revenue will be much bigger.

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**Brett Simpson** - Arete - Analyst

Thank you. And just a follow-up, with regards to HPC, we're seeing a lot of specialty memory, high-bandwidth memory, increasingly being packaged with your CoWoS. Does TSMC have any interest in developing stacked memories for HPC? Thank you.

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**Elizabeth Sun** - Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division

Okay. Will TSMC be interested in developing specialty memory such as the high-bandwidth memory ourselves to satisfy our business in CoWoS?

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**C.C. Wei** - Taiwan Semiconductor Manufacturing Company Ltd - President and Co-CEO

Well, we don't produce the special memory per se by TSMC but we are working with memory companies to provide the service and the HBM.

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**Brett Simpson** - Arete - Analyst

And does TSMC expect -- yes -- would TSMC be interested in developing its own memories for HPC long term?

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**C.C. Wei** - Taiwan Semiconductor Manufacturing Company Ltd - President and Co-CEO

No.

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**Brett Simpson** - Arete - Analyst

Okay. Thanks very much.

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**Elizabeth Sun** - Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division

All right. Let's come back to the floor. Next question will be coming from Goldman Sachs, Donald Lu.

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**Donald Lu** - Goldman Sachs - Analyst

(Spoken in foreign language). Very nice to see you, Chairman.

One question is on the demand outlook for next year. It seems like everything except the smartphone is declining, and smartphone is increasing only 6%. How do you get to 4% semi growth? Is the smartphone content going to increase?

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**Morris Chang** - Taiwan Semiconductor Manufacturing Company Ltd - Chairman

How do I get --?

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**Elizabeth Sun** - Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division

Right. Chairman says semiconductor growth is 4%. So, Donald's saying that smartphone is 6% --

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**Donald Lu** - *Goldman Sachs - Analyst*

Yes, and also smartphone mix is going to the low end, as well, so.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

That's a tough question, Donald. I'm trying to -- I mean, these numbers are all compiled by our own forecaster, and again he tells me what other forecasters are saying, and it seems that all of them are saying about 4%, 3%, 4%, or even more, 5%. Now you're asking, well, where do they come from?

Mark says silicon content. Answer the question loudly please.

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**Mark Liu** - *Taiwan Semiconductor Manufacturing Company Ltd - President and Co-CEO*

You're right, the silicon content of smartphone will increase from 2016 to 2017.

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**Donald Lu** - *Goldman Sachs - Analyst*

So, even the mix is going more to the low end --

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**Mark Liu** - *Taiwan Semiconductor Manufacturing Company Ltd - President and Co-CEO*

Even mix. We see the silicon content for all tiers increases, and the low end increases more. But overall the silicon content will increase high single-digit next year.

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**Donald Lu** - *Goldman Sachs - Analyst*

I see. Great. Yes, we are making our forecast based on your forecast, so it's good to know why.

My second question is more on the AI, although I, like Mark commented, with early stage, but it's pretty hot. So, how should we look at the opportunity for TSMC for AI? I mean, there's a big -- the server side, building the model, there's also the premise on the handset or PC. Which market will be bigger and how should we predict it in the future for TSMC? Is there any thoughts on that?

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

We will see -- we do see a lot of opportunity in, you know, we have four growth platforms. The first one is mobile, the smartphones. The second one is high-speed computing. The third one is IOT. The fourth one is automotive. And we do see a lot of opportunities for artificial intelligence in all those three platforms now. Perhaps Mark, will you care about -- will you care to say some more about the high performance computing and perhaps C.C. will say something more about IOT and automotive? Yes.

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**Mark Liu** - *Taiwan Semiconductor Manufacturing Company Ltd - President and Co-CEO*

I think AI is coming as a killer application for the industry and people are excited. And one of the reason is there is a tremendous progress in the algorithms that makes the machine can do much more than traditional programming -- programmable machine. This is the machine can think and do things.

So for the application side it's immense, as many of you must have read on these growing opportunities. All the cloud providers are in this field.





Now, in AI, for us, I think it's also an important opportunity for us. Let me just talk about the computing side of AI. AI needs deep learning and collecting a lot of data, therefore it requires very massive computation. And in the past years our technology development is collecting our pace and we now can provide the world's most competitive technology for those artificial intelligence computing purposes. That's number one. So the people who can get into this field is across the industry, using our technologies.

Secondly is this AI is -- this application is new, so the all the algorithm or the architecture, they are all new. So the computing -- so the -- hello?

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

You're on.

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**Mark Liu** - *Taiwan Semiconductor Manufacturing Company Ltd - President and Co-CEO*

Okay. So the -- basically it's the playing field is leveled. It's not as before, where the high component is computing. It has to be a certain architecture to get into this field. This is a levelling playing field, so many players are into this field. That is where the massive innovation can come. So we are very excited. Also because of this we see the application will include many segments.

So we develop this advanced packaging, and that is an area that requires the AI application. And that area is also we spent several years getting to this and now already come to the fruit that be it InFO or the CoWoS and there'll be multiple generations of that advanced packaging.

So, from the technology side, we are prepared to embrace this -- many people call it explosive growth.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Mark, leave some time for C.C. too.

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**Mark Liu** - *Taiwan Semiconductor Manufacturing Company Ltd - President and Co-CEO*

(Multiple speakers) the AI.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Yes, but there's no -- I think there's a lot of growth opportunities for IOT and automotive too.

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**C.C. Wei** - *Taiwan Semiconductor Manufacturing Company Ltd - President and Co-CEO*

Well --

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

In connection with AI as well.

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**C.C. Wei** - *Taiwan Semiconductor Manufacturing Company Ltd - President and Co-CEO*

In connection with the AI, I think we need to have a lot of sensor connectivity. You know that right -- constituted a big -- all the data format and connect with that AI so they can do a lot of applications.

So we do believe that in the future that IOT, which is the data for our sensor connectivity, put all of them together and combine with other high speed -- high performance computing, and then form the fundamental basis of that there, of the AI. That's -- and we do expect the IOT periods to grow very fast, because of the -- in the future you will see a lot of applications, even the autonomous driving -- you need to look at all the background, all the environment surrounding a car. And also the car has to communicate with the cars together, so everything.

We protect the future in that the whole world, you will see a lot of connectivity, a lot of sensors. And that's where we constituted our IOT business.

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

Okay, the next question will be coming from Daiwa's Rick Hsu.

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**Rick Hsu** - *Daiwa Capital Markets - Analyst*

Hi. Happy new year, Dr. Chang and all. I guess my first question goes back the -- your second quarter and third quarter business outlook. I think, despite a weak Q1 revenue, Mr. Chairman was talking about your second quarter revenue and Q3 revenue will grow significantly. And you also mentioned about your 10-nanometer ramp up would be also meaningful in these two quarters.

What's that main demand driver behind that growth momentum in terms of applications? Would that be just coming from mobile? Or across the board of mobile, professional gaming and et cetera?

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Just repeat the question.

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

Yes. It's, Rick, your question is what's the growth driver for our second quarter and third quarter business, is it only from mobile, or from other areas?

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Well, actually, the simplest answer to your question is growth drivers are always customers' demand, you know. And -- but I will elaborate. I think we are more -- we do have more concentrated customers today than we did several years ago. So those particular customers' demand fluctuation impacts our seasonal -- I mean, our quarterly fluctuations a great deal -- a great deal. And so, seasonality, to us, doesn't mean very much any more. Every year's seasonality is different from the next year's or last year's.

Last year we had a pretty low first quarter and a pretty strong second quarter. And then the third and fourth quarters were even stronger. Yes, I think, right? And this year, at least at this point, we see a somewhat different pattern. So, yes, it was -- it's customer demand. And of course, technology plays a part. 10 nanometers ramp-up.

**Rick Hsu** - *Daiwa Capital Markets - Analyst*

Thank you so much. That's clear. The second question probably goes to Lora or maybe to Mr. Chairman as well. Can you give us more insight or color of your cash dividend this year? Any kind of ballpark number?

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

What was the question?

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

He wants to know additional color on this year's dividends per share.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Lora?

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**Lora Ho** - *Taiwan Semiconductor Manufacturing Company Ltd - SVP, CFO*

Okay. I have a short answer. We will increase cash dividends in 2017. Magnitude? I prefer to wait for the board meeting in February. You're going to know by then.

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**Rick Hsu** - *Daiwa Capital Markets - Analyst*

Thank you so much.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

You won't have long to wait. I mean, February is something like -- I don't remember the exact date of the Board meeting.

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

February 14.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Yes.

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

This February.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Eighth and ninth. Well, I think, yes, I'll pause. The final decision is made by the annual shareholders' meeting and that's in June. The Board's recommendation on the dividend will be announced to the public after the Board meeting.

**Rick Hsu** - *Daiwa Capital Markets - Analyst*

Thank you.

**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

All right. Next question will be coming from HSBC, Steven Pelayo.

**Steven Pelayo** - *HSBC - Analyst*

Great. Thank you. The segments that you report to us, communications, consumer, computing and other, are helpful, but now two-thirds of your business is coming from computing, so we can't really divine a lot from that. We're all excited about automotive and AI and high performance computing, IOT. If we want to use those as the segments, what percentage of revenues does TSMC get from each of those categorizations today?

**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

(Inaudible).

**Mark Liu** - *Taiwan Semiconductor Manufacturing Company Ltd - President and Co-CEO*

For last year, roughly with the mobile, it's 55%, 56% and high performance computing, for the definition I just said, it's about 15%, roughly. And PC is not a growing sector, but is about 10%. And then IOT and automotive, both of them are less than 10%.

**Steven Pelayo** - *HSBC - Analyst*

Okay. Maybe a question for Lora. I'm very impressed with your gross margins in the first quarter, potentially going up, even on down maybe 10% in revenues. Could you talk a little bit about the nodes and the utilization rates, maybe, in the first quarter? Is 16-nanometer falling off significantly, yet you're making up the margin elsewhere? Help us understand maybe what's driving the margins in the first quarter, if we looked at each of the individual nodes and how they're going to perform?

**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

The 16-nanometer is not falling off. I just said I wish our market share were higher, okay. It's not falling off.

**Steven Pelayo** - *HSBC - Analyst*

So 16-nanometer will be flat, sequentially?

**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

I'm sorry. Other than 16-nanometer not falling off, I didn't hear the question.

**Lora Ho** - *Taiwan Semiconductor Manufacturing Company Ltd - SVP, CFO*

Steven, actually you are asking a product mix thing, right? It's -- there's more than product mix. Actually, it's improving profitability in each technology node, particularly 16-nanometer, and we have a very significant amount of revenue coming from 16-nanometer in the first quarter. And the 28-nanometer continued to be a very strong node.

Those two nodes actually supported our first quarter margin pretty well, despite of lesser revenue growth or declined revenue growth. That was the main reason. And the past the -- as I said earlier -- continual cost improvement efforts in operation side, that also helps.

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**Steven Pelayo** - *HSBC - Analyst*

Just a follow-up there. If you look at your full year gross margins, 2016, about 50% or so, you're suggesting maybe even as much as 53% or higher in the first quarter. Are TSMC's structural gross margins maybe higher this year that we can maybe look for a couple of hundred basis points' growth for full year 2017 gross margins?

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

What was the question?

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

All right, Steven, if I understand your logic, this question is, given 50% growth margin for TSMC for the full year, and 10-nanometer will take two points away from our margins in the second half, then that means first half our gross margin will be very good, to get the 50% average, and so --

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Well, look. Let's not take all the numbers I say literally. I mean, when I said -- I mean, we do have a narrow range. It's not -- the range is not zero. When I say that we want to keep our structural profitability at about close to 50%, I mean, at least give me one or two points leeway, okay? It's not exact figures. Give me one or two points leeway. Yes. So it's like 49%, 50%, yes.

We really can't even forecast the next quarter's gross margin that closely. We always have a range whether two or three points.

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**Lora Ho** - *Taiwan Semiconductor Manufacturing Company Ltd - SVP, CFO*

Yes, I mean, two or three points. We cannot be that precise.

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

But I think Steven's main question is, do we increase our structural profitability this year?

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Oh. Well, I think that most of that -- most of the improvement has already happened. It has already happened. If you look back six or seven years, we have improved it by several hundred basis points in the -- and that was not easy at all. That was not easy. And I think that I will say most of the improvement has already occurred, so from this point on, our priority is to maintain it.

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**Steven Pelayo** - HSBC - Analyst

If I could just sneak one more quick one in. When do you think 10-nanometers will be more than 10% of revenues? Which quarter of this year?

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**Elizabeth Sun** - Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division

Which quarter 10-nanometer will exceed 10%.

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**Morris Chang** - Taiwan Semiconductor Manufacturing Company Ltd - Chairman

Do we answer questions like that?

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**Elizabeth Sun** - Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division

Sometimes in the second half of this year, yes.

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**Morris Chang** - Taiwan Semiconductor Manufacturing Company Ltd - Chairman

Well, if we answer questions like that I think it will be Lora. I mean, you don't have to answer.

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**Lora Ho** - Taiwan Semiconductor Manufacturing Company Ltd - SVP, CFO

The big volume comes on the second half. So, the whole year will be more than 10%.

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**Morris Chang** - Taiwan Semiconductor Manufacturing Company Ltd - Chairman

Well, his question is when does it exceed the 10%, I think.

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**Lora Ho** - Taiwan Semiconductor Manufacturing Company Ltd - SVP, CFO

Third quarter.

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**Morris Chang** - Taiwan Semiconductor Manufacturing Company Ltd - Chairman

Really?

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**Elizabeth Sun** - Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division

Okay, next question will be coming from Credit Lyonnais, Sebastian Hou.

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**Sebastian Hou** - Credit Lyonnais - Analyst

Thank you, Dr. -- so Chairman and the two CEOs --

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Careful now. He means margin. He doesn't mean gross margin.

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

Yes, revenue.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Revenue. Yes. Okay, good. Just wanted to be sure that Lora understood the question. Yes.

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**Sebastian Hou** - *Credit Lyonnais - Analyst*

Thank you. So my first question is on the assumption of the growth rate that Chairman already mentioned about smartphone unit growth this year you expect 6%. And Mark mentioned about the silicon (multiple speakers).

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

What did you say? I'm sorry, what did you say?

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

The growth rate. Smartphone, Chairman mentioned units.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Oh, smartphone? Okay.

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**Sebastian Hou** - *Credit Lyonnais - Analyst*

Yes, 6% and silicon counters grow about high single-digit, per Mark, which means we're growing about 13%, 14%. And given that mobile account for 55% to 60% of the total revenue this year, which means smartphone alone, or mobile device alone, it contributes 7% to 8% of the growth of this year, whilst the growth in high performance computing and -- double-digit growth -- and also IOT growth, of 34% the whole market, which means -- seems like easily to reach the high end of the growth, even close to 10% for this year. I'm not sure if my assumption is right, or too bullish?

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**Mark Liu** - *Taiwan Semiconductor Manufacturing Company Ltd - President and Co-CEO*

Assumption is right, calculation may not be. The -- yes, I think that most of the growth this year will be -- come from smartphone. 80% of that. And that's because IOT and automotive are small. They do have a -- looking to 20% to 30% growth for those growth areas, but contribute to the whole company is still very small. So to compose the rest of it. So I think -- I don't calculate any up to that number. I think it's still in line about 7%, between 5% to 10% probably in the middle. That's my calculation.

**Sebastian Hou** - *Credit Lyonnais - Analyst*

Okay, thank you. And my second question is on the President-Elect Donald Trump in the United States, that his policy is to create more job, and thank you, Chairman, for mentioning about how TSMC has helped create more jobs indirectly in the United States. But I'm wondering if you have already got some pressure from your customers in the US that maybe when they do the calculation factoring the tax incentives that they think that maybe having manufacturing back in the US will be more -- can help them to improve their profit? I'm not sure. So I'm just wondering whether you think about or ever consider building a fab in the US, and under what kind of the scenario and circumstances?

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

Sebastian, your question is whether or not we have pressure from US-based customers wanting us to build a manufacturing site in the US so that they can capture --

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

No.

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

-- incentive?

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**Sebastian Hou** - *Credit Lyonnais - Analyst*

No. Okay. My -- sorry, my second part of that question is under what scenario and circumstances will TSMC consider building a fab in US?

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

Will we ever consider going there and build a fab in --

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

I do not rule it out.

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**Sebastian Hou** - *Credit Lyonnais - Analyst*

Okay. Thank you.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

I do not rule it out, but I see a lot of sacrifices that we and our customers will have to make if we do that. Keep in mind that we earned our business in the United States, not by lower labor costs in Taiwan. In fact, on the whole, our labor costs in Taiwan -- our labor costs in Taiwan are not lower than the United States.

Now, we earn our business by being good. Let's give you an example. Every year we send thousands of engineers from one location to another, and we have three locations in Taiwan, Taichung, Hsinchu and Tainan. Now Taichung and Hsinchu are within daily commuting distance. Tainan -- and you can even make a point that Tainan and Hsinchu and Tainan and Taichung are within daily commuting distance also. It's a little hard but I





know of people in New York, Manhattan, I know people that commute an hour-and-a-half, two hours each way every day. If you are willing to do that you can certainly commute between Tainan and Taichung or Tainan and Hsinchu also.

Now, backing up a few steps, you don't want to do that, it takes too long. It's still within weekly commuting distance. So every year we send literally over a thousand, 2000 engineers from one location to another who'll be there for months and that allows us to ramp up things quickly and to solve problems quickly also where one location, one fab has got a problem then another fab -- engineers from another fab can go ahead and help them. Literally thousands, thousands of engineers do that every year. Now if we have a plant in the US we won't be able to do that anymore.

Second point, we have thousands of vendor people here. Actually they're already in Hsinchu -- already in Hsinchu, Tainan and some in Taichung also. Thousands of engineers from our partners located here. These are things that are not low labor cost. These are things that we're going to lose if we set up a plant in the US. If we lose these things our customers will lose too.

Yes, I don't rule it out and actually I would never rule that out but year after year time and again we consider the subject and we have not made the decision to go there. Except of course early in our life we did set up WaferTech in the United -- and it's still going. It has between 1500 employees -- about 1500 employees. It's still going but other than that -- and that was set up in 1996. After that we consider the question every so often and we have not made the decision to set up a plant in the United States.

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

Okay, with that we need to go back to the line. Operator, can you please have the next caller on the line?

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**Operator**

Certainly. The next question is from the line of Mehdi Hosseini from SIG. Please go ahead.

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**Mehdi Hosseini** - *Susquehanna Financial Group - Analyst*

Yes, thanks for taking my question and Dr. Chang, good to hear your voice on the call. I have a question on the 10 nanometer. If your 16 nanometer market share is about 65%, what is your view on your market share when you migrate to 10 nanometer? And I have a follow up.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Well, our market share in 10-nanometer. I think I vowed about once -- must have been a year ago because I was here last time a year ago -- I vowed then that every new node from now on we have a market share higher than our market share on 16.

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**Mehdi Hosseini** - *Susquehanna Financial Group - Analyst*

Okay, so more than 65%, is that your answer?

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

What?

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

Would that be above 65%?

**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Very definitely. Very definitely.

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**Mehdi Hosseini** - *Susquehanna Financial Group - Analyst*

Okay. Then when we look into 7 nanometer and some of your competitors have a different definition of 7. Can you help us understand how your N7, compete and is positioned against your competitors?

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

So Mehdi is saying that our 7 nanometer definition is different from other companies' 7 nanometer definition, so how do we compete at 7?

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Our 7 nanometer definition is different from somebody else's? Well, I'll let Mark answer.

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**Mark Liu** - *Taiwan Semiconductor Manufacturing Company Ltd - President and Co-CEO*

I wouldn't want to comment on other people's 7 nanometer. Our 7 nanometer is under qualification now and it will be qualified as according to plan from the end of first quarter. And we have already more than 20 customers design-in on this 7 nanometer and this year alone we estimate will be 15, 20 tapeouts already. So this is our momentum build so far on a seven nanometer and no other competitor is getting to this stage of this leading edge technology.

So we have -- we are to -- remember I mentioned last time we'll have 5 nanometer two years from now and forget about the name. That will be a full node shrink and that will sit competing well with any technology come out at that time.

Okay, let me add some on 7 nanometer. We will maintain our 7 nanometer competitiveness just like we do on 28 and 16. We will have a technology currently planned as 7 nanometer but with the EUV insertion in the second year of 7 nanometer, just one year -- approximately one year after. And that can greatly simplify the process and without increase the cost. And that is if customer can take advantage of minor design it can further reduce their density -- increase their density and reduce their die cost. That is our plan to maintain that competitiveness of the 7 nanometer the year after.

So we think 7 nanometer is a well adopted node by all the customers and we plan for the subsequent technology to shore up the demand continuously. And we hope to use this technology -- I mean the second-year technology to prepare for the EUV production experience for the full fledged EUV technology on 5. Then our customers can have a very hopefully smooth getting to from our 7 to our 5 nanometer technology. So that is how we maintain our technology competitiveness.

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**Mehdi Hosseini** - *Susquehanna Financial Group - Analyst*

May I ask a clarification question?

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

Sure.

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**Mehdi Hosseini** - *Susquehanna Financial Group - Analyst*

I think if I heard you correctly is you will insert -- if I heard you correctly you said you will insert EUV in this second year of your 7 nanometer, which suggests to me that you may actually be able to commercialize (technical difficulty) conclusion here?

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

Mehdi, I'm afraid that your voice was broken at some point in time. Can you please repeat? We heard you, that you said that we will insert EUV in the second year of 7 nanometer and then you had something but it was cut off. Can you repeat that part?

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**Mehdi Hosseini** - *Susquehanna Financial Group - Analyst*

Sure. Yes, sorry about that. I just wanted to make sure I understand the EUV commentary correctly. You said that you will insert EUV in the second year of 7 nanometer. That suggests to me that you may actually be able to insert EUV before competitors that have said insertion would happen at 5. Is that the right conclusion as we compare and try to better understand your competitiveness at 7 nanometer?

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**Mark Liu** - *Taiwan Semiconductor Manufacturing Company Ltd - President and Co-CEO*

Yes, we will commercialize the 7 EUV in the second year of our 7-nanometer production. I wouldn't comment on when will our competitor insert their EUV. That is -- I don't intend to do the comparison here.

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**Mehdi Hosseini** - *Susquehanna Financial Group - Analyst*

Got it. Thanks so much for the details. I appreciate it.

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

Thank you. Now we come back to the floor. The next question will be going to Deutsche Bank's Michael Chou again.

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**Michael Chou** - *Deutsche Bank - Analyst*

Just two quick questions. One is, what will be the tax rate in 2017?

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**Lora Ho** - *Taiwan Semiconductor Manufacturing Company Ltd - SVP, CFO*

It's similar to 2016, 13%, 14% effective tax rate.

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**Michael Chou** - *Deutsche Bank - Analyst*

Second question, sir. If we look at the first three years of 7 nanometer's TAM, will that be bigger than 28 nanometer for the first three years as well? Yes, 10. Total addressable market.

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**Lora Ho** - *Taiwan Semiconductor Manufacturing Company Ltd - SVP, CFO*

Total available --



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**Michael Chou** - *Deutsche Bank - Analyst*

Total addressable market.

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**Lora Ho** - *Taiwan Semiconductor Manufacturing Company Ltd - SVP, CFO*

Addressable market, yes. In terms of dollar much bigger.

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**Michael Chou** - *Deutsche Bank - Analyst*

Much bigger.

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

Okay then going to HSBC's Steven Pelayo again.

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**Steven Pelayo** - *HSBC - Analyst*

Just two quick questions from me as well. With 2016 finished now I believe if I remember correctly from your 20-F 2015 you had two customers that were 16% of revenues each. I'm curious, what was your customer concentration in 2016?

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**Lora Ho** - *Taiwan Semiconductor Manufacturing Company Ltd - SVP, CFO*

I think in general our top five customers account for about 50% of revenue and top 10 about 70%. This percentage hasn't changed much over years.

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**Steven Pelayo** - *HSBC - Analyst*

Any more details on the ones you disclosed that are over 10% of revenues? I can wait for the 20-F.

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**Lora Ho** - *Taiwan Semiconductor Manufacturing Company Ltd - SVP, CFO*

Please wait for 20-F.

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**Steven Pelayo** - *HSBC - Analyst*

Okay. My second question was you generated over TWD200 billion in free cash flow this year on TWD950 billion in revenues. Roughly 20%, 22% of revenue is free cash flow. Quite nice but if you're talking about high teens growth in depreciation this year, maybe 10% growth in your EBIT you're probably going to add another TWD80 billion or so by my calculation to your free cash flow, which could get you over 30% of revenues. Is that a realistic target to think about this year, TSMC generates more than 30% of revenues in free cash flow?

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**Lora Ho** - *Taiwan Semiconductor Manufacturing Company Ltd - SVP, CFO*

I cannot be that precise but I think our free cash flow will grow this year versus last year.



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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

Now going to Credit Suisse, Randy Abrams.

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**Randy Abrams** - *Credit Suisse - Analyst*

I've got two quick follow ups. The lull that you're seeing in the business now, could you talk about how broad based that lull is, if it's across application in markets or if it's select parts? The lull -- you mentioned a lull in the business that you're moving through. How broad is that lull across application or your customer base?

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

The lower end?

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**Randy Abrams** - *Credit Suisse - Analyst*

The lull. No, you talked about like a slowdown, so for that slowdown if you could talk by application if it's across your business broad based or if it's isolated to certain areas.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

First half of this year, what's the weaker area of our demand, right?

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**Randy Abrams** - *Credit Suisse - Analyst*

(Inaudible).

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

I think mobile.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

What was the question?

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

The question is with respect to the first half of this year what will be the area that the demand is relatively weaker?

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Do you want market sector?

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**Randy Abrams** - *Credit Suisse - Analyst*

Yes, market. Broad based.

(Multiple speakers)

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Can you answer that question, Lora?

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**Lora Ho** - *Taiwan Semiconductor Manufacturing Company Ltd - SVP, CFO*

What was the question? Sorry. Can you please tell me what was the question?

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**Randy Abrams** - *Credit Suisse - Analyst*

How broad based is the slowdown and which applications are you seeing that slowdown and any areas holding up stronger?

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**Lora Ho** - *Taiwan Semiconductor Manufacturing Company Ltd - SVP, CFO*

First quarter?

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**Randy Abrams** - *Credit Suisse - Analyst*

First quarter or first half.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Well, I think Mark, do you know the answer, Mark?

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**Mark Liu** - *Taiwan Semiconductor Manufacturing Company Ltd - President and Co-CEO*

Let me answer the question. The slowdown really come from the seasonality of our major customers in the mobile areas. And there will be minor inventory correction because as Lora mentioned, exiting last year is two days above inventory and exiting first quarter may be slightly higher still. So we see some minor inventory correction going after but we don't see a major slowdown at all.

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**Randy Abrams** - *Credit Suisse - Analyst*

And the second follow up for the R&D expense. I think you talked about increase. If you could talk about the range you see R&D moving in an increased percent of sales.

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

R&D as a percent of sales, right?

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**Randy Abrams** - *Credit Suisse - Analyst*

You talked about it rising.

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

Right, we say we are going to increase the R&D spending as well as the percentage, so what's the percentage?

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

It's approximately 8%.

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**Lora Ho** - *Taiwan Semiconductor Manufacturing Company Ltd - SVP, CFO*

Percent.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

8%.

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**Lora Ho** - *Taiwan Semiconductor Manufacturing Company Ltd - SVP, CFO*

Last year it was 7.5%. This year it will be slightly above 8%.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

When I said a moderate increase in its percent, I mean several tenths basis points, alright? Several tenths basis points.

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

Alright, follow up question from Goldman's, Donald Lu.

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**Donald Lu** - *Goldman Sachs - Analyst*

I have a question on inventory -- in Q4 has declined quite substantially and will it increase substantially in Q1 and would that be potential boost to gross margins in Q1?

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**Lora Ho** - *Taiwan Semiconductor Manufacturing Company Ltd - SVP, CFO*

I don't believe so. Not in Q1.

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

Okay, follow up question from Credit Lyonnais, Sebastian Hou and I think that should be our last question for this conference today.



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**Sebastian Hou** - *Credit Lyonnais - Analyst*

Thank you for letting me ask. My question is, is there any impacts you see there from the minimum wage hike and (inaudible) new regulation by the government, Taiwan Government?

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

What was the question?

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**Sebastian Hou** - *Credit Lyonnais - Analyst*

On the cost side.

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

Okay, what's the impact of the government's new policy on (inaudible) and the minimum wage.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Yes, our first estimate is that it will increase our cost about 30 basis points, 30 basis points. That's right isn't it, Lora?

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**Lora Ho** - *Taiwan Semiconductor Manufacturing Company Ltd - SVP, CFO*

That's right, 0.3% of cost.

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**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Yes.

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**Sebastian Hou** - *Credit Lyonnais - Analyst*

So it's on the cost of goods sold.

And my second question is on the 2016 CapEx. That turns out to be actually slightly higher than the last conference revision, about like TWD500 million, so I wonder whether that's just a cash pull-in -- cash payment pull-in or any other plan change of the capacity?

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**Lora Ho** - *Taiwan Semiconductor Manufacturing Company Ltd - SVP, CFO*

It's just pull-in of a payment. There's nothing changing in capacity build up.

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**Sebastian Hou** - *Credit Lyonnais - Analyst*

Thank you.

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**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

Okay, I think we have concluded our Q&A session. Before we conclude today's conference please be advised that replay of the conference will be accessible within three hours from now. Transcript will become available 24 hours from now.

**Morris Chang** - *Taiwan Semiconductor Manufacturing Company Ltd - Chairman*

Again, I wish you a very happy new year.

**Elizabeth Sun** - *Taiwan Semiconductor Manufacturing Company Ltd - Senior Director, TSMC Corporate Communications Division*

Okay, thank you for joining us today. We hope you will join us again next quarter. Good bye and have a good day.

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