Research Update:

TSMC 'twAAA/twA-1+' Ratings Affirmed On Robust Performance; Outlook Stable

September 21, 2020

PRIMARY CREDIT ANALYST

Raymond Hsu, CFA
Taipei
+886-2-8722-5827
raymond.hsu
@spglobal.com
raymond.hsu
@taiwanratings.com.tw

SECONDARY CONTACT

Anne Kuo, CFA
Taipei
+886-2-8722-5829
anne.kuo
@spglobal.com
anne.kuo
@taiwanratings.com.tw

Rating Action Overview

- Taiwan Semiconductor Manufacturing Co. Ltd. (TSMC) is the world's largest semiconductor foundry service provider, generating EBITDA of New Taiwan dollar (NT$) 661 billion in 2019.
- TSMC is likely to solidify its leadership and grow its EBITDA strongly in 2020 with a surge in demand for its 5 nanometer (nm) and 7nm process technology from top clients to make chips for 5G mobile communications and high performance computing applications.
- TSMC could sustain a growing net cash position because projected operating cash flow of NT$800 billion will be sufficient to meet its raised capital expenditure (capex) of US$16 billion-US$17 billion (NT$464 billion-NT$493 billion) and cash dividends of NT$250 billion-NT$300 billion in 2020.
- On Sept. 21, 2020, Taiwan Ratings affirmed its 'twAAA' long-term and 'twA-1+' short-term issuer credit ratings on TSMC, as well as the 'twAAA' issue ratings on TSMC's unsecured common corporate bonds.
- The stable outlook reflects our expectation that TSMC's strengthened technology leadership will enable the company to weather business uncertainty stemming from the COVID-19 pandemic and trade tensions between the U.S. and China, and maintain its strong profitability and net cash position over the next 12-24 months.

Rationale Action Rationale

Strong demand for TSMC's 7nm and 5nm foundry services should drive earnings growth amid the pandemic and growing tensions between the U.S. and China.

We expect TSMC's EBITDA margin and revenue to rise over the next few quarters. We expect the suspension of sales to Huawei Technologies Co. Ltd. under tightened U.S. restrictions to only have an impact over the next three to four quarters before the market adjusts to the new rules and orders from other major clients rise to fill the space left by Huawei. TSMC announced that it would cease shipments to Huawei after the grace period of the restrictions on Huawei ended on Sept. 14, 2020.

We believe growing demand from 5G mobile communications, cloud services, internet of things, and other emerging technology will offset likely weakness in corporate and consumer spending on information technology (IT) induced by COVID-19. This should support mid- to high-single digit growth in TSMC's revenue in 2021 after solid growth of about 25% in 2020. Working from home, homeschooling, and inventory stocking in response to COVID-19, and escalating technology frictions between the U.S. and China have spurred unexpected demand growth for semiconductors in 2020, despite a deep global recession.

TSMC's margins will likely rebound materially in 2020-2021 with a significant increase in utilization and the improving cost efficiency of new technology.

We expect the company's EBITDA margin to improve to about 64% in 2020 from 61% in 2019 because of rising utilization, particularly for the 7nm and 5nm process technology. The strong demand should also push up utilization even with aggressive capex. TSMC's revenue and wafer shipments grew 35.2% and 31.0% year on year in the first half of 2020. We expect the company to increase its capacity utilization above 90% in 2020 from 81% in 2019, despite aggressive capacity additions. We believe improving yield and cost efficiency of TSMC's production using 7nm process technology will also help the company to strengthen its margins in the coming quarters.

The successful implementation of 3nm process technology in 2022 should further solidify TSMC's technology leadership.

The company has expanded its technology leadership with the introduction of 5nm process technology ahead of its main competitor, Samsung Electronics Co. Ltd., in the first half of 2020. We believe TSMC continues to have a much broader customer base for this technology node than Samsung, enabling the company to sustain its majority market share in advanced technology nodes including 7nm and 5nm processes. We also expect TSMC to maintain its strong market share in foundry services using 28nm technology over the next few quarters. TSMC's competitiveness against Intel Corp. and Samsung in terms of process technology will be further enhanced if the company can implement mass production using 3nm process technology in the second half of 2022, in line with its current plan. Intel's disclosure of a delay in its 7nm chip until 2022 and a likely strategic shift to outsource the fabrication of its central processing units (CPU) could further expand TSMC's addressable market, in our view.

Elevated capex will not affect TSMC's financial strength.

The company plans to increase its capex to US$16 billion-US$17 billion in 2020 to meet stronger-than-expected demand for its 7nm and 5nm processes and sustain an elevated spending level in 2021. This will keep the ratio of capex to revenues significantly above 30% over the next two years. However, we expect TSMC to sustain its net cash position with positive discretionary cash flows over 2020-2021 because rising EBITDA and cash flow generation will be sufficient to meet rising capex as well as large cash dividends. Our base case is also based on our expectation that TSMC will emphasize the stability and sustainability of its cash dividends without significantly increasing its payouts in 2020-2021 after an increase of about 25% in 2019. We also expect the company to sustain its policy of focusing on cash dividends without share buybacks. We do not expect TSMC to take on material acquisitions because of the company's strategy to focus on foundry services particularly with leading-edge technology.

Outlook

The stable outlook reflects our view that TSMC's dominant market position and strengthened leadership in process technologies, particularly of 5nm and 7nm, will help the company overcome business headwinds related to COVID-19 and tensions between the U.S. and China. TSMC is therefore likely to sustain strong profitability and cash flow over the next two years.

We also expect TSMC to generate positive discretionary cash flow and maintain a net cash position on an adjusted basis in 2020-2021, though the company plans to materially raise its capex in 2020-2021.

Downward scenario

We could lower the rating on TSMC if:

- The company fails to maintain its leading technology position and loses market share, resulting in significant deterioration in its profitability and cash flow.
- The company changes its prudent financial policy through more aggressive shareholder distributions or mergers and acquisitions, and takes on high leverage. A ratio of debt to EBITDA exceeding 1.0x for an extended period, increased cash flow volatility due to mergers and acquisitions, or a weakening competitive position could indicate such a change.

Company Description

TSMC was the world's first dedicated semiconductor foundry and remains the largest by market share, offering a comprehensive set of integrated circuit fabrication (fab) processes to manufacture a full range of semiconductors. The company operates one 6-inch wafer fab, four 8-inch wafer fabs, and four 12-inch wafer fabs in Taiwan. The company also has fabs in the U.S. and China. In the second quarter of 2020, revenue from 28nm or more advanced process technologies accounted for about 69% of the company's total revenue.

Our Base-Case Scenario

Assumptions

- Global GDP will decline 3.8% in 2020 but rebound 5.3% in 2021.
- Accelerating spending on 5G mobile communications and cloud computing induced by COVID-19 may be insufficient to fully offset weaker corporate and consumer spending as well as business disruptions related to U.S. sanctions. We therefore expect flat or slight growth in global semiconductor demand in 2021. This follows similar rise in 2020 driven by working from home, homeschooling, and inventory stocking, despite weak consumer spending. The foundry business could still grow faster with growth of fabless companies and increasing outsourcing from integrated device manufacturers.
- TSMC's sales growth to be in the mid-20s percentage in 2020 because of significant volume growth as a result of strong growth in 5G mobile communications and high performance computing using 5nm and 7nm process technology.
- Growth is likely to decelerate to mid-to-high single digit in 2021 because of weakening corporate and consumer IT spending as well as the destocking of inventory built in 2020 after the COVID-19 pandemic eases.

- Utilization rates will improve to slightly above 90% in 2020 from 81% in 2019 with strong demand for 7nm and 5nm process technology and improving utilization for 28nm processes.
- The company's blended selling price to rise by mid-single digit in 2020 and continue to rise at low-single digit in 2021 because of growing contribution from 5nm and 7nm process technology, despite the appreciation of the New Taiwan dollar.
- TSMC's annual capacity growth to be 4%-8% in 2020-2021, mostly in advanced process technology.
- Its expenses on research and development to stay at 7%-8% of sales in 2020-2021.
- Capex to be US$16 billion-US$17 billion in 2020 and remain above US$15 billion in 2021, mostly to support advanced technology capacity expansion.
- No change in the company's cash conversion cycle.
- Cash dividend payout in 2020-2021 to be 70%-75% of the previous year's net income to maintain stable cash dividend payments.
- 15% "haircut" on cash and short-term investments for surplus cash adjustment on debt for 2019 and the projection period.

Key Metrics

Taiwan Semiconductor Manufacturing Co. Ltd. -- Key Metrics

(Bil. NT$)	2018	2019	2020f	2021f	2022f
Revenue	1,031.5	1,070	1,310-1,360	1,400-1,450	1,430-1,460
EBITDA	683.9	661.4	823-873	890-940	920-950
EBITDA margin (%)	66.3	61.8	62-66	62-66	61.5-65.5
Debt	0.0	0.0	0.0	0.0	0.0
Discretionary cash flow	57.9	(102.5)	30-70	50-100	75-125

f--Taiwan Ratings Corp. forecast.

Liquidity: Strong

The short-term rating on TSMC is 'twA-1+. We believe TSMC has strong liquidity. We estimate the company's ratio of liquidity sources to liquidity uses will be 1.5x-2.0x over the 24 months ended June 30, 2022.

We also believe TSMC has strong banking relationships and can absorb high-impact, low-probability events without refinancing, given its persistent net cash position. The company's credit standing in local capital markets is very strong, evidenced by the interest rate of 0.64% on its 10-year local bonds issued in May 2020. TSMC's borrowings carry no financial covenants.

Principal liquidity sources include:

- Cash and short-term investments of about NT$650 billion at the end of June 2020.
- Funds from operations of NT$790 billion-NT$840 billion per year over the next 24 months.

Principal liquidity uses include:

- Long-term debt due in one year and short-term debt of about NT$190 billion at the end of June 2020.
- Annual capex of NT$450 billion-NT$510 billion over the next 24 months.
- Annual cash dividend payout of NT$259 billion-NT$340 billion for the period.

Issue Ratings--Subordination Risk Analysis

Capital structure

TSMC had about NT$281 billion in debt and no financial debt at its subsidiaries as of end-June 2020.

Analytical conclusions

We do not notch down the issue rating from the issuer credit rating on TSMC because the company's debt leverage is very low and we assess its financial risk profile as minimal, suggesting low subordination risk to senior unsecured debtholders.

Ratings Score Snapshot

Issuer Credit Rating: twAAA/Stable/twA-1+

Note: The descriptors below are on a global scale.

Business risk: Strong

- Country risk: Intermediate
- Industry risk: Moderately high
- Competitive position: Excellent

Financial risk: Minimal

- Cash flow/Leverage: Minimal

Anchor: twaaa

Modifiers

- Diversification/portfolio effect: Neutral (no impact)
- Capital structure: Neutral (no impact)
- Financial policy: Neutral (no impact)
- Liquidity: Strong (no impact)
- Management and governance: Strong (no impact)
- Comparable rating analysis: Neutral (no impact)

Related Criteria & Research

Related Criteria

- General Criteria: Methodology For National And Regional Scale Credit Ratings - June 25, 2018
- Criteria | Corporates | General: Reflecting Subordination Risk In Corporate Issue Ratings - March 28, 2018
- General Criteria: Guarantee Criteria - October 21, 2016

- General Criteria: Group Rating Methodology - July 01, 2019
- Criteria | Corporates | General: Corporate Methodology: Ratios And Adjustments - April 01, 2019
- Criteria | Corporates | General: Methodology And Assumptions: Liquidity Descriptors For Global Corporate Issuers - December 16, 2014
- General Criteria: Country Risk Assessment Methodology And Assumptions - November 19, 2013
- General Criteria: Methodology: Industry Risk - November 19, 2013
- Criteria | Corporates | General: Corporate Methodology - November 19, 2013
- General Criteria: Methodology: Management And Governance Credit Factors For Corporate Entities - November 13, 2012
- General Criteria: Principles Of Credit Ratings - February 16, 2011

Related Research

- Taiwan Ratings' Ratings Definitions – August 10, 2020

(Unless otherwise stated, these articles are published on www.taiwanratings.com)

Ratings List

Ratings Affirmed

Taiwan Semiconductor Manufacturing Co. Ltd.	
Issuer Credit Rating	twAAA/Stable/twA-1+
Unsecured corporate bond issue rating	twAAA

Certain terms used in this report, particularly certain adjectives used to express our view on rating relevant factors, have specific meanings ascribed to them in our criteria, and should therefore be read in conjunction with such criteria. Please see Ratings Criteria at www.taiwanratings.com for further information. Complete ratings information is available to subscribers of Rating Research Service at rrs.taiwanratings.com.tw. All ratings affected by this rating action can be found on Taiwan Ratings' public website at www.taiwanratings.com.