Josh Smith Student Research

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Semiconductor Manufacturing

Texas Instruments Inc

Date

Ticker: ● TXN
Price: ● $187.51

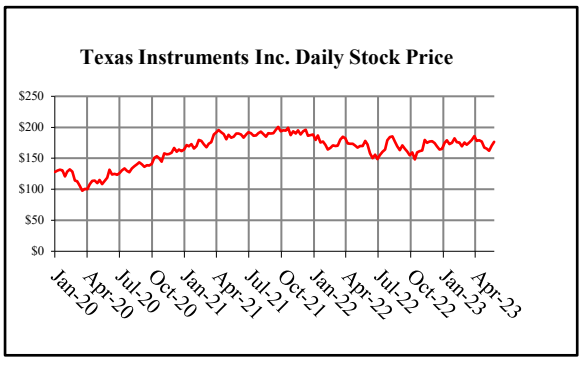
Recommendation: ● Sell
Price Target: ● 120.20

Earnings/Share

	Mar.	Jun.	Sept.	Dec.	Year	P/E Ratio
2022A	$2.35	$2.45	$2.47	$2.13	$9.41	16x
2023A	$1.85	$1.87	$1.85	$1.49	$7.07	22.7x
2024A	$1.20	$1.22	$1.47	$1.30	$5.20	35.0x
2025A	$1.28	$1.41	$1.48	$1.27	$5.45	31.9x
2026A	$1.68	$2.14	--.--	--.--	--.--	--.--

Highlights

- **Key Merits:** World's largest maker of analogue chips. 20+ years of consecutive years of dividend increase. Low systematic industry risk because of diversified consumer base (Automotive, Industrial, Data Centres). Announced deal to acquire Silicon Labs (2026). Years of heavy capital expenditure/investment i.e. owned fabs.
- **Key Risks:** EPS highlights the cyclical or seasonal nature of the industry. Valuation (P/E) has run off and not followed the fall and rise of EPS, possible market correction. Capitally intense industry. Strong Competition with Analog Devices (ADI) and Monolithic Power Systems Inc (MPWR). 2025 saw Trump announce tariffs, creating artificial demand for Texas Instruments as consumers ordered more before anticipated tariff costs. This could mean current demand is "borrowed" from the future and demand could tank short term. On top of possibly lower future demand, retaliatory tariffs or restrictions from China are a indirect flow on consequence choking demand further. 90% of TXNs' market is offshore.



52 Week Price Range	$159.2-$220.29
Average Daily Volume	9.2M shares
Beta	1.31
Dividend Yield (Estimated)	2.03%
Shares Outstanding	913.2M shares
Market Capitalization	$255.4B
Institutional Holdings	568.32M shares
Insider Holdings	4.77M shares
Book Value per Share	$19.72
Debt to Total Capital	43.8%
Return on Equity	33%

Business Description

Texas Instruments is a mature manufacturer of Analogue and less so Embedded Processing semiconductor chips. Instead of straight to consumer products like AMD and NVIDIA, Texas Instruments Primarily supplies to companies for their industrial, communication, and personal equipment as well as more recently data centres and automotive.

What makes Texas Instruments unique?

It is a large, long-standing, and diversified supplier of the less visible chips often referred to as "analogue semiconductors", which are used across large-scale markets such as industrial equipment and automotive. Its scale, massive product portfolio, and long-term investment in manufacturing give the company significant production capacity, cost advantages, and control over its supply chain.

Industry Overview and Competitive Positioning

Texas Industries market is highly competitive and shared, with demand driven by increasing semiconductor use in new areas such as automotive and areas with renewed growth such as data centres. Key risks include cyclical demand, excess inventory as the technology sectors shelf life is relatively short. High manufacturing costs and investment.

Major Market Players:

- Analog Devices (ADI)
- Infineon Technologies (IFX)
- NXP Semiconductors (NXPI)
- STMicroelectronics (STM)
- Microchip Technology Inc (MCHP)

Market Position & Advantage

TXN is a major, well established, player in analogue semiconductors, the market is not dominated by one firm. Texas Instruments advantages include scale, range of products, global distribution networks and manufacturing capacity in house.

Valuation

I value Texas Instruments (TXN) with four methods. Two are absolute: a multi-stage dividend discount model (DDM) and a discounted free cash flow to equity (FCFE) model. Two are relative: price-to-EBITDA and price-to-cashflow against five semiconductor peers. Cross checked against analyst consensus. Both absolute models use a CAPM required return of 11.68%. The inputs/assumptions are a risk-free rate of 4.57% (the 10-year U.S. Treasury yield), a beta of 1.31 (Yahoo Finance) and a market return of 10%. The absolute models value TXN at 32–40% of its $187.51 market price on 31 December 2024. The relative models value it about 20% below that price. The weighted result is a target price of $120.20USD and a Sell recommendation.

DDM - ABSOLUTE

The DDM forecasts dividends per share (DPS) for five years in three stages:

Interim growth: I used analyst EPS forecasts. EPS is expected to rise from $5.20 in 2024 to $5.55 in 2025 (6.7% growth) and $6.26 in 2026 (12.8%). I applied these rates to DPS, which assumes a constant pay-out ratio. It is assumed the 2026 rate of 12.8% is held in 2027.

Transition: 2028 growth is weighted two-thirds interim and one-third terminal (9.19%). 2029 growth is weighted one-third and two-thirds (5.59%).

Why not PRAT or sustainable growth? Both get zero weight because both depend on earnings retention. In 2024, dividends of $4,795 million equaled 99.9% of net income ($4,799 million), so retention was 0.08% and both

methods give about zero growth. Their multi-year averages reflect years of higher retention that no longer apply. 23.7% for PRAT (2020–2023) and 19.0% for sustainable growth (2020–2024).

Terminal growth: I used 1.98%, TXN's revenue CAGR from 2020 to 2024 ($14,461 million to $15,641 million). This is close to the suggested 2% and to long-run inflation, which is a assumed with a mature, cyclical manufacturer. The period ends at a cyclical low, so the rate is bareish.

Forecast DPS is $5.61, $6.33, $7.14, $7.80 and $8.23 for 2025 to 2029, with a terminal value of $86.53 at 2029. Discounted at 11.68%, the DDM gives $74.78 per share, 60% below the market price. The terminal value accounts for $49.80 of that, or 67%. The DDM captures only dividends, which yield 2.8%. To justify $187.51 at an 11.68% required return, dividends would have to grow about 8.7% a year forever. For this reason the DDM is a lower weight.

DCF - ABSOLUTE
The DCF discounts FCFE. It uses the same growth path, required return (11.68%) and terminal growth (1.98%) as the DDM. FCFE grows from $3,828 million in 2024 to $5,992 million in 2029. The equity value of $54,421 million, divided by 919 million diluted shares, gives $59.22 per share, 68% below market. The DCF comes out below the DDM because the base year is on a decline due to multiple reasons. 2024 FCFE was 44% below 2022 ($6,822 million). It also includes $2,380 million of net borrowing: $2,980 million of new long-term debt less $600 million repaid. Operating cash flow less capex was only $1,498 million. Capex was $4,820 million, which is 31% of revenue and 3x times D&A of $1,580 million, as TXN builds new 300 mm fabs.

I tested a base year with capex at $2,500 million and no new borrowing. It gives $3,768 million, almost the same as the actual base. The low value therefore comes from the growth rate and required return. The terminal value is again 67% of the total. At $187.51, the market price implies FCFE growth of about 9.3% a year forever.

Price to EBITDA - RELATIVE VALUATION
The target multiple is the average of the five competitors 2024 price-to-EBITDA. TXN's 2024 EBITDA is $7.39 per share. Using 2025 EBITDA grown at the 6.7% interim rate, it trades at 23.8x, still above competitors. Prefer EBITDA to earnings (P/E of 36.1x) because EBITDA excludes the rising depreciation from TXN's new fabs, so it is less distorted by these expenses. TXN is worth $154.33, 17.7% below market.

Price to Cash Flow Ratio - RELATIVE VALUATION
Using the same approach, the competitor average 2024 price-to-cash-flow multiple of 21.4x is applied to TXN's operating cash flow of $6.87 per share. This gives $147.05, 21.6% below market. Price-to-cashflow ignores capex, and TXN's capex is three times D&A. This method is bullish, so I interpreted its result as a higher estimate.

OTHER ANALYSTS
As of December 2024, 30 analysts cover TXN: 10 Buy, 1 Hold and 4 Sell, with a target price of $211.33 (Market price of $187.51). While ratings are cautious, they factor in the cyclical nature and anticipated demand of the automotive industry. Models use a 2024 dataset, and do not assume are cyclical return. Because interim rates are taken from analyst EPS forecasts ($5.55 for 2025 and $6.26 for 2026). It comes from terminal growth and the required return.

COMPARABLE COMPANIES
The competitors are Analog Devices (ADI), NXP (NXPI), Infineon (IFX), Monolithic Power Systems (MPWR) and STMicroelectronics (STM). Like TXN, all are analogue semiconductor firms. Their multiples vary widely.

2024	P/EBITDA	P/CF
TXN	25.4x	27.3x
ADI	26.9x	29.1x

2024	P/EBITDA	P/CF
NXPI	12.0x	19.0x
IFX	8.8x	14.7x
MPWR	50.1x	36.6x
STM	6.6x	7.6x
Average of Comp.	**20.9x**	**21.4x**

FINAL RECOMMENDATION

DCF (30%): It measures the cash actually available to equity holders, the declining 2024 base does not distort it.

Relative (30%): It reflects how the market currently prices comparable firms, which balances absolute models anchored on a bad performing year year.

DDM (20%): Dividends have exceeded FCFE since 2023 and pay-out is almost 100% of net income, so dividends understate TXN's value, therefore using a weaker weight.

Analyst consensus (20%): Not our own valuation so its weight is limited. More of a cross reference our model is in line with the rest of the market analysts consensus.

Three methods contribute $77.93 of the target before the analyst component. The Sell call holds for any consensus target below $454. 2024 was a weak year. Compared with 2022, revenue fell 22% and net income 45%, dividends took 99.9% of earnings, and the P/E is 36.1. At a CAPM required return, TXN is expensive on both dividends and cash flow. Therefore recommend Sell.

RISKS TO FINAL RECOMMENDATION

Terminal growth: The terminal value is 67% of both absolute values, and the 1.98% rate is measured from a cyclical low. Something DDM is sensitive to minor changes in.

Required return: The 11.68% rate depends on a beta of 1.31 and the 10% market return.

Cycle timing: All models are anchored on a low year. A faster recovery in earnings toward 2022 levels is the main risk to a Sell call.

Financial Analysis

TXN's 2024 results combine a cyclical downturn with a heavy investment cycle. Earnings and free cash flow fell sharply.

Earnings

From 2022 to 2024, revenue fell from $20,028 million to $15,641 million, and net income fell from $8,749 million to $4,799 million. Revenue grew only 1.98% a year from 2020 to 2024. This reflects lower fab utilization and depreciation from the new fabs. With a payout ratio of 99.9% and a P/E of 36.1, the market is valuing TXN on an expected recovery rather than current earnings.

Cash Flow

Operating cash flow fell from $8,720 million in 2022 to $6,318 million in 2024. Over the same period, capex rose from $2,797 million to $4,820 million, so operating cash flow less capex fell from $5,923 million to $1,498 million. FCFE fell from $6,822 million to $3,828 million. Dividends kept rising, from $4,297 million to $4,795

million, and have exceeded FCFE since 2023. Free cash flow would improve once the fabs are built this cycle and capital expenditure falls.

Balance Sheet & Financing
Total debt rose from $9,154 million in 2022 to $14,377 million in 2024 ($868 million short-term and $13,509 million long-term). Debt-to-equity rose from 0.63 to 0.85. Cash and short-term investments fell from $9,067 million to $7,580 million, leaving net debt of $6,797 million. Interest expense more than doubled to $508 million, and operating income now covers it 10.3x times, down from 48.6 times in 2022. Net PP&E rose from $7,307 million to $12,133 million, and inventories reached $4,527 million, 2.4x times their 2021 level. Leverage remains moderate.

Investment Risks

TXN is exposed to the semiconductor cycle. Most of its revenue comes from industrial and automotive customers, so a long downturn in those markets would delay the recovery the stock price already assumes. The new fabs add fixed costs and depreciation. If demand recovers slower than anticipated, low utilization will keep margins down. China is a significant market. That exposes TXN to tariffs, export controls, possible trade action against U.S. analogue chips.

The dividend is also a risk. Payout is 99.9% of earnings, so further increases depend on borrowing. A dividend freeze would weaken a key reason I think investors pay a premium for the stock.

Using DDM, DCF, and Relative models does not account for cyclical risks in the semiconductor industry. This is similar to seasonality in Data Science and the prices in the dataset would have to be shifted to remove a time series trend like this. … tie into what actually happened in 2025, 2026, why my recommendation is off

Ethics

Texas Instruments itself identifies ethical risks as: Human rights, child labour, and responsible sourcing. They state the use of conducts ('Responsible Business Alliance Frameworks'), audits, and assessments.

In terms of the environment, semiconductor manufacturing uses significant natural resources (water, energy, chemicals). Texas Instruments has set emissions targets and is increasing renewable electricity use, while also reporting reductions in water use and waste initiatives.

Culture - ESG Issues

Texas Instruments operates a global manufacturing and supply network, creating challenges around different labour standards, environmental regulations, cultural expectations, and most recently trade regulations. Texas Instruments addresses these with their global supplier standards, human rights assessments and third-party audits.

Carbon footprint: Because of Texas Instruments large manufacturing footprint creating ongoing environmental and resource-use issues. Texas Instruments has stated it is committed to reducing Green House Gas emissions and water consumption. Texas Instruments has committed to reducing Scope 1 and 2 emissions by 42% and scope 3 GHG emissions by 35% by 2030 from its baseline.

From a third party perspective they take issue with Texas Instruments "yielding to political activism" in shaping their corporate governance. But this is the exact sort of social governance the Bloomberg certs. Asserts are favourable. I disagree with 1792 Exchanges assessment, but this highlights that culture is a qualitative and perspective-based assessment criteria.

MAXIMUM LENGTH FOR MAIN PART OF REPORT:
5-6 PAGES

APPENDIX – max 3 pages

Do not put Financial statements here; they should only be in your Spreadsheet.
Put tables here that you refer to in your text, but are too big for the main pages.

Figure: DCF Cash Flows
in millions

Source: Company Documents, Student Estimates

Figure ●: Industry Comparable Financials
(if not already shown in previous section)

Source:

Ethics ●: Supply-chain ethics
in millions

Source:

Figure ●: Other Statements or Exhibits
in millions

Source: Company Documents, Student Estimates

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