



# NXP Semiconductors N.V.

## *Too Much (multiple) Dip in that (micro) Chip*

- It is no secret that information technology is one of the hardest-hit sectors in 2022 so far. Rising interest rates are depressing valuations, and inflationary pressures are straining both consumer and enterprise wallets, while also intensifying FX hits to top-line. Considering these headwinds, our team chose a name best-positioned to capitalize on growing markets with sticky demand that is less vulnerable to the macro.
- Although the semiconductor industry is traditionally regarded as cyclical, the coexistence of past and future end-markets is changing its fundamentals. With over 85% exposure to business units that include EVs, smart factories, and 5G, our team firmly believes NXPI will be a top beneficiary from the widespread adoption of these applications. Management continues to reiterate unwavering demand, proving now is the optimal time to take advantage of an industry-wide sell-off and expose the Fund to technology of the future.
- NXPI boasts a leading relative market share in over half of its end-markets. We expect this high RMS core business to support growth in its ADAS, Radar, and secure connected edge solutions as customer preferences in automotive and industrial markets continue to shift.
- Despite NXPI's stellar backlog and accelerated growth drivers across each unit, it still trades at a 45.2% discount to its three-year NTM P/E median. Through our DCF and multiples analyses, we see shares having ~25% upside with our price target of \$192/share.

### COMPANY OVERVIEW

Founded in 2006 and headquartered in the Netherlands, NXP Semiconductors N.V. (NXPI) is a global semiconductor manufacturing company. In FY'21, it generated \$11.1 bn in total sales, which it reports through the following four end markets: Automotive (50% of FY'21 revenue), Industrial & IoT (22%), Communication Infrastructure & Other (16%), and Mobile (13%). NXPI's chips are used in various applications, including advanced driver assistance systems (ADAS), mobile communications, personal security, and consumer electronics.

NXPI's sales can be further broken down by geographic region, which are as follow: Greater China & Asia Pacific (58% of FY'21 revenue), EMEA (18%), Americas (12%), Japan (7%), and South Korea (5%). In addition, it operates six total front-end manufacturing facilities across the Netherlands, US, and Singapore, as well as four back-end sites located in the APAC region. NXPI is scheduled to report 3Q'22 earnings on November 1<sup>st</sup>, 2022.

Downside Scenario	Current Price	Price Target	Upside Scenario
\$131.00	\$153.51	\$192.00	\$227.00
(15%)		25%	48%

<b>Symbol</b>	NASDAQ: NXPI
<b>52-Week Range</b>	\$140.33 – 239.91
<b>YTD Performance</b>	(32.3%)
<b>Market Cap (M)</b>	\$42,252
<b>Net Debt (M)</b>	\$7,615
<b>Dividend Yield</b>	2.1%
<b>NTM P/E</b>	10.8x
<b>NTM EV/EBITDA</b>	9.5x
<b>ROE</b>	34.0%
<b>ROA</b>	11.3%
<b>ROIC</b>	16.1%

FY (Jan)	2021A	2022E	2023E
<b>EPS (Adj.)</b>			
Q1	1.25	2.48	2.85
<i>YoY Change</i>		98%	15%
Q2	1.42	2.53	2.94
<i>YoY Change</i>		78%	16%
Q3	2.26	2.91	2.94
<i>YoY Change</i>		29%	1.0%
Q4	2.60	3.03	2.98
<i>YoY Change</i>		17%	(1.7%)
Year	7.53	10.95	11.71

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## INVESTMENT SUMMARY

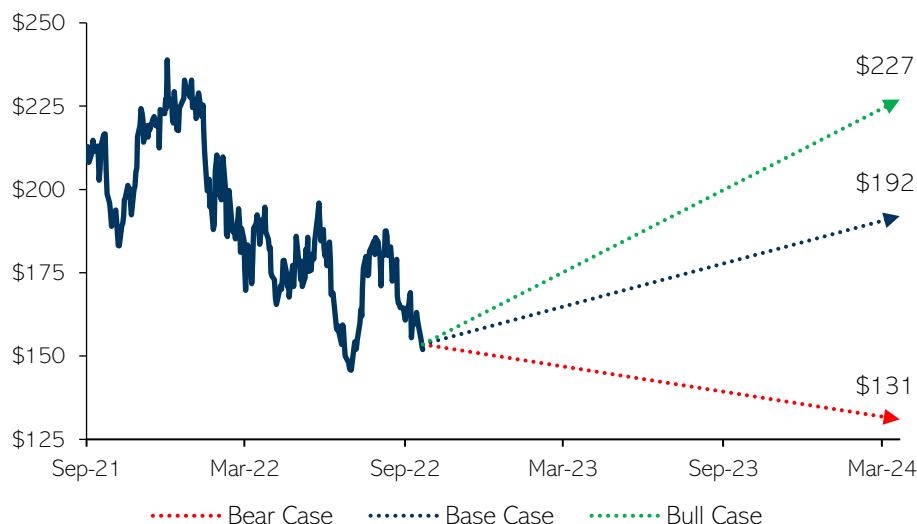
**Headquarters**  
Eindhoven, Netherlands

**Chief Executive Officer**  
Kurt Sievers

**Number of Employees**  
31,000 (as of FY'21)

**GICS Classification**  
Information Technology

**GICS Sub-Industry**  
Semiconductor Devices



## PRICE TARGET SCENARIOS

**Bull Case Price Target: \$227.00**

**12-18 Month Target Return: +48%**

Revenue grows at a 9.5% CAGR from FY'22 to FY'26 as automotive customers increase their orders to satisfy EV production goals and more factories adopt IoT applications in order to keep up with competition. Constraints on the supply side ease up, and NXPI's lead times drop below 52 weeks, allowing it to meet ~90% of backlog demand. The CI&O segment picks up pace as the Company leverages its leading position in RF power devices to expand 5G infrastructures. Smart home rebounds, and NXPI regains its #1 market position in BMS as it wins new relationships with top automakers. It achieves 57.5% gross margins in FY'26 by maintaining higher ASPs while input costs begin to lower. The Company's capex investments lower by 50 – 100 bps of sales as it gains manufacturing capacity through government stimulus. It returns an additional \$1 bn to shareholders through buybacks this year.

**Base Case Price Target: \$192.00**

**12-18 Month Target Return: +25%**

Revenue grows at an 8.0% CAGR from FY'22 to FY'26 as end-market demand for EVs continues to outpace the available supply and IoT adoption grows, especially in industrial applications. The Mobile segment sees slowing sales for the next three quarters, but demand returns by the end of our time horizon. EBIT margins slightly decrease in FY'23 due to strain on the supply-chain. The Company maintains gross margins within the target 56 – 57% range as it successfully passes rising input costs through to customers. Penetration into BMS, ADAS, and smart factory markets aids top-line growth, and its risk-adjusted backlog remains ~80%, indicating sticky demand. Customers do not cancel NCNR orders, and NXPI boosts production capacity through the help of government stimulus plans. Management repurchases \$3 bn of shares through FY'24, and raises dividends low-DD each quarter.

**Bear Case Price Target: \$131.00**

**12-18 Month Target Return: (15%)**

Revenue grows at a 6.1% CAGR from FY'22 to FY'26. Slowing demand creeps into the Automotive and Industrial & IoT segments, which achieve a soft-landing in the semiconductor cycle by YE'23. Gross margins fall below 55%, beneath management's target range, as material prices remain volatile. SG&A costs increase with wage inflation, causing EBIT margins to hover around 21%. Geopolitical tensions increase, putting pressure on the Company's in-house manufacturing capabilities, causing them to issue new debt and increase capex spend.

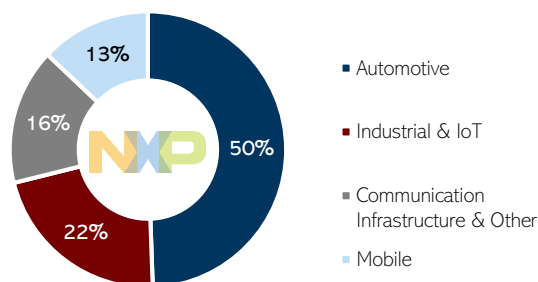


## BUSINESS OVERVIEW

### Automotive

NXPI is the 2<sup>nd</sup> largest automotive chip supplier in the world, contributing 11.8% to the \$46.7 bn market. The Company's revenues in this segment heavily depend on vehicle production, vehicle sales, and vehicle adoption of semiconductors. The number of semi applications per vehicle continues to increase with the wide adoption of electric vehicles (EVs). EV sales have been the main beneficiaries of government action facilitating the transition to net zero emissions and demand for greater fuel efficiency. Key growth drivers in this segment include advanced driving assisted systems (ADAS) and electrification.

NXPI Segment Breakdown



Source: Company Filings

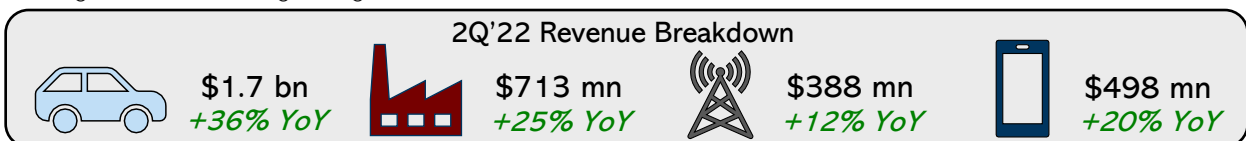
- **ADAS:** This is used in applications such as radar and vision systems to enhance vehicle safety, a top priority among vehicle manufacturers. The radar systems use microcontrollers (MCUs), an integrated circuit designed to complete programmed tasks, to continually track the distance between vehicles in real time. This allows the cars to use safeguarding techniques to keep the passengers safe.
- **Electrification:** NXPI's electrification applications are divided into three segments: EV inverter control, connected EV system solutions, and high voltage battery management systems. EV inverter control converts DC voltage to AC voltage to drive motor traction. The connected EV systems manage the vehicle's energy to ensure it is used in the most range-efficient way. Finally, the high voltage battery management system controls the charging and power of the rechargeable Lithium-ion battery.

### Industrial & Internet of Things (IoT)

This segment is center stage in the global shift towards digitalization. The end market has a diverse portfolio of applications such as factory & building automation, smart home, home entertainment, and medical electronics.

- **Factory & Building Automation:** Growth in the Industrial segment will be driven by replacing legacy factory equipment with newer, digital equipment. New products are equipped with various sensors, processors, and security-related chips. NXPI's chips help synchronize multiple industrial devices together through machine learning technology. These products are designed to make factories more energy and cost-efficient, making it advantageous for businesses to invest in these technologies.
- **Smart Home:** This segment saw extraordinary growth during the pandemic with WFH and online learning. Smart home is broken down into three categories: smart appliances, home controls & security, and smart entertainment. The homeowner can control all these applications through voice and face recognition. The devices are fully interconnected, allowing the homeowner to check anything from air quality to energy consumption costs for the home just through the customers' phones.

**Mobile:** NXPI designs and produces semiconductors for mobile phones, tablets, wearables, and accessories. NXPI's microcontrollers enable mobile product features, such as mobile payments and ultra-wideband wireless connectivity. The Company's MCUs are used for interface displays, power management & battery charging, radio frequency amplifiers & receptors, RFID, network & data sharing encryption, sensors, and Bluetooth connection. The Company's ultra-wideband technology affords a longer wireless range for devices, enabling hands-free payments, credential sharing, and item tracking with greater ease and convenience.



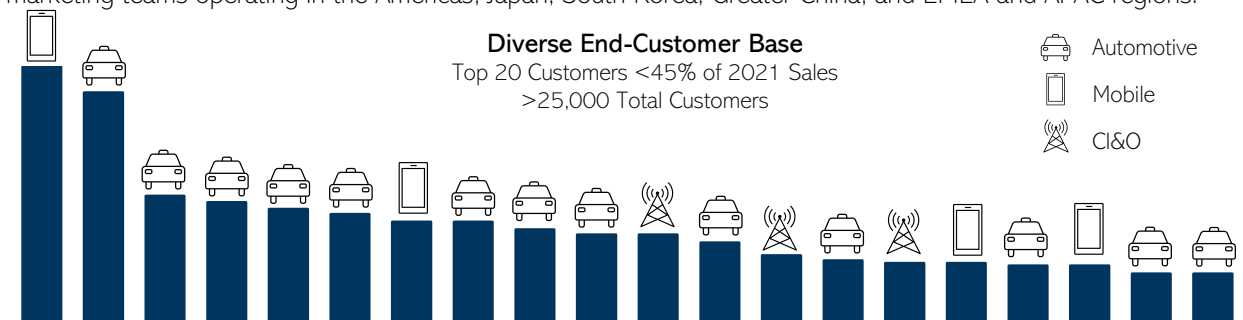


## Communications Infrastructure & Other

This segment manufactures products geared towards end markets for 5G networks, digital network communications, and secure edge identification services. The Company's semiconductor products are used in wireless base stations, network & security applications, credit & debit cards, government ID cards, passports, transit cards, and radio frequency identification (RFID) tags.

- Wireless Basestations: NXPI produces communication processors that integrate several tasks to facilitate wireless communication. These processors enable a computing core, which stores memory and programs to accept radio frequencies transmitted over high-speed networking equipment or cables. Wireless chips are used in data centers, routers, Wi-Fi access points, and security networks. The Company also offers processors for transmission and reception of low-range 5G frequencies.
- Network and Security: The Company designs and manufactures security controllers to facilitate the secure transfer of information from physical documents like credit cards, passports, and IDs to the receiving infrastructure. NXPI's SmartMX products encrypt user data and securely transfer it to the reader infrastructure, where it is then decrypted and able to be processed.

**Sales & Customers:** NXPI sells its products to distributors, original equipment manufacturers (OEMs), and contract manufacturers. It generates 55% of its revenue from distributor customers and 44% from OEMs. Distributors are intermediary vendors who buy products from the manufacturer to sell to other companies in the distribution channel. OEMs are companies that use the products to manufacture their own goods to sell to manufacturers further downstream in the supply chain. Its three largest distributor clients are Arrow, Avnet, and WT Micro. Some of NXPI's largest OEM customers include Apple, LGE, Samsung, and Bosch. It has a global client footprint with sales and marketing teams operating in the Americas, Japan, South Korea, Greater China, and EMEA and APAC regions.



**Manufacturing:** NXPI produces integrated circuits and semiconductors through its wholly-owned factories, joint ventures, and outsourced manufacturers. It splits its operations into front-end and back-end manufacturing. The front-end involves the wafer fabrication process. This entails imprinting silicon wafers with the circuitry needed to perform a function. The back-end process involves the assembly, testing, packaging, and preparation for product distribution. Back-end processes are not as complex and technical as front-end processes, allowing the Company to cut costs in this area through outsourcing. Due to the sensitivity of front-end operations, most of NXPI's fabrication facilities are located in the US and Europe. It also outsources some operations to TSM and GF. NXPI has a joint venture with TSM, entitling it to ~60% of a Singapore-based fabrication facility's production capacity. The back-end operations are located in southeastern Asian countries due to the cost-saving advantages in the region.

Front-end			Back-end	
Site	Ownership	Wafer Size	Site	Ownership
Singapore (SSMC)	61.2%	8"	Kaohsiung, Taiwan	100%
Nijmegen, the Netherlands	100%	8"	Bangkok, Thailand	100%
Austin (Oak Hill), United States	100%	8"	Kuala Lumpur, Malaysia	100%
Chandler, United States	100%	8"	Tianjin, China	100%
Chandler RF, United States	100%	6"		
Austin (Ed Bluestein), United States	100%	8"		

*Source: Company Filings*



## INDUSTRY OVERVIEW

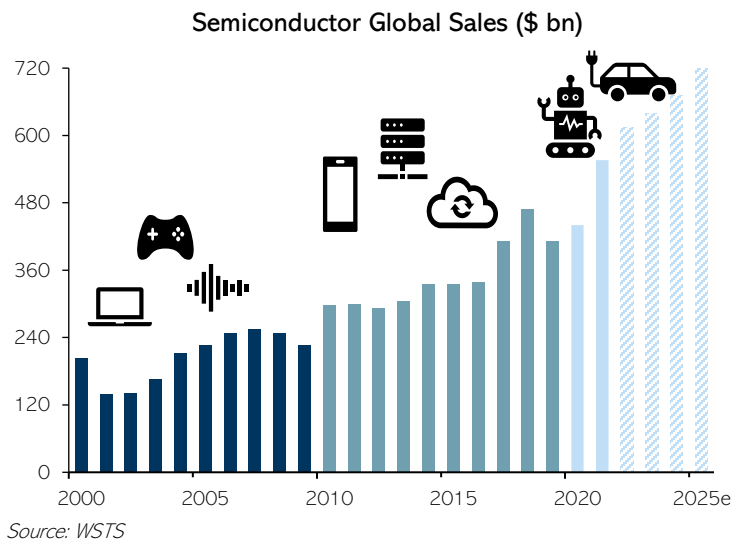
Since the start of the century, global technology has transformed how individuals, businesses, and nations operate, and the semiconductor industry is the driving force behind this change. A semiconductor device, or microchip, is an electronic component that conducts electricity under certain conditions. The most commonly used element for a chip is Silicon due to its ideal atomic properties and natural abundance. With their wide variety of applications, semis are often regarded as the “brains” of modern electronics. **Last year, this market totaled \$556 bn, which industry titan Intel expects to grow at a 6.7% CAGR through 2030 to reach \$1 tn.**

- This industry plays a critical role in the global economy. Just in the US, it employs roughly 250k people directly and supports 1.8 mn additional jobs. While the US holds ~50% of the global market share by product sales, which amounted to \$258 bn in FY'21, American companies outsource more than half of their wafer production to manufacturers overseas. The largest pure-play foundry is Taiwan Semiconductor Manufacturing Company (TSM), which produces 65% of the world's semiconductors and more than 90% of the most advanced chips.
- The overall need for semiconductors will never stop; however, the secular tailwinds driving demand are everchanging. Booming demand in emerging end markets tends to fluctuate in 10-year cycles. In 1995, computers and consumer electronics accounted for an overwhelming 70% of semiconductor applications, while industrial and automotive only made up 12% and 5%, respectively. This trend continued until the 2010s, when smartphones, data centers, and cloud computing gained popularity. Looking ahead, the opportunity extends far beyond just the tech sector. From automating factories and cars to digitalizing surgical rooms, smart connected devices enabled by the most advanced chips will be a primary focus.

### It's a cycle... but which way are we going?

Since semiconductor companies are ultimately manufacturers, the ebb and flow of sales volume directly relate to supply and demand. Chips also face the risk of becoming obsolete when newer and faster designs are engineered, adding further volatility to the cycle. During upturns, manufacturers ramp up capacity to take advantage of high ASP. However, this often leads to suppliers flooding the market with semis, ultimately bringing chip prices and profits down. These boom-bust patterns are why semis have a reputation for cyclical.

According to COVID-19, it's up



The pandemic exacerbated supply-chain disruptions around the world, preventing semiconductor companies from sourcing critical components for their products. While producers struggled to maintain production, consumers demanded even more chips as WFH expanded home offices and server uses. This imbalance led to an industry boom. Typically, cycle upturns last ~8 – 10 quarters, but many analysts now question if COVID-19 permanently altered the semis landscape due to extended lead times and stronger than ever end-market demand.

### Government Talks

In an effort to solve the prolonged chip shortage and steal market share from foreign powerhouses, many countries are passing legislation to boost domestic capacity. In Jul'22, Congress passed the CHIPS and Science Act, which will award US companies an aggregate of \$52 bn in subsidies to construct manufacturing facilities; for perspective, this represents only 12% of US-made chips today. Foundry companies, like TXN and INTC, should be the primary recipients of funds. Europe is taking similar steps, having passed the EU Chips Act earlier this year. This will mobilize €43 bn for R&D and fab expansion; Europe's goal is to double its share in semi production to 20% by 2030.



## That was ELECTRIC

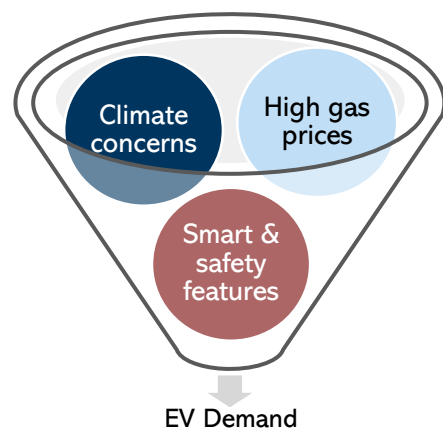
At the beginning of the pandemic, car sales plummeted; Europeans bought 80% fewer cars, while American and Chinese sales fell 50% and 70%, respectively. Responding to this trend, the industry canceled orders for automotive parts, including semiconductors. As a result, semiconductor fabs refitted their facilities to accommodate surging demand for chips that go into personal electronics and data center hardware. Towards the beginning of 2021, consumer purchases of cars ramped back up with the help of government stimulus. To satisfy this demand, automakers began placing orders for semiconductors again. According to Susquehanna Financial Group, average lead times jumped from 15 to 26 weeks from 2021 to 2022, as fabs struggled to build out new capacity.

- Against the backdrop of this, automakers were embarking on a monumental shift. In response to an evolving market, thanks to Tesla and many other flashy EV startups, legacy automakers announced plans to electrify their offerings, all but ensuring a future of EVs. GM announced investments of \$35 bn in EV production capacity and plans to phase out internal combustion engines (ICEs) by 2035, while Ford committed \$50 bn to make 50% of sales EVs by 2030. ***AlixPartners projects a global EV investment of \$526 bn by 2026.***
- This has compounded the semiconductor shortage. EVs require 3,000 chips on average, three times more than the 1,000 that go into a typical ICE-powered car. This, along with skyrocketing EV production, caused chip demand to surge. McKinsey projects the automotive chip market will grow at a 13% CAGR from \$50 bn in 2021 to \$150 bn in 2030; this would represent 15% of the semiconductor market, up from 8% in 2021.

## What's *Driving* This Trend?

The rapid shift in consumer and industry sentiment towards EVs is attributable to several things. The most prominent is government action mandating the phaseout of internal combustion engines in order to meet greenhouse gas emission reductions. To make this shift more affordable, governments are increasing subsidies. The Inflation Reduction Act creates a \$7,500 tax credit for consumers who purchase an EV assembled in the US.

- California and the European Union have passed legislation to phase out ICE vehicles by 2035. China will require 40% of vehicles sold to be electric by 2030. These three markets accounted for ~35 mn vehicle sales in 2021. Industry leaders understand this is where the world is moving and want to get ahead of the trend.
- Moreover, consumers' preferences are changing. A recent survey revealed 14% of consumers would buy an EV, up from 4% in 2020, with 71% of respondents showing some degree of interest in purchasing an EV. The recent volatility in gas prices has prompted frustrated consumers to consider EVs, where they are not susceptible to fluctuations in fuel costs.
- As younger generations become a larger portion of the consumer market, environmental concerns are a larger factor in car buying decisions. As the effects of climate change grow more prevalent, younger generations want to reduce their emissions by opting for an EV over the more polluting ICE vehicle.



However, there are challenges to this shift. McKinsey estimates the US needs 1.2 mn charging stations by 2030, well above the current amount of 124k. The Bipartisan Infrastructure Law only allocates spending for 500k stations by 2030. The largest concern consumers have about EVs is that there will not be convenient public charging.

## Where Cars are Going

Cars are integrating more technology to enhance the safety of their passengers; ADAS systems protect passengers through emergency braking, blind spot detection, pedestrian detection, and more. This technology is underpinned by semiconductors, which process the external data and make decisions for the safety of passengers. According to Future Market Insights, ***the \$15 bn ADAS market will grow at a CAGR of 14.1% to \$43 bn in 2030.***



## New Networks, More Semis

Internet of Things (IoT) connects multiple devices to a larger group of networks through the cloud, creating a seamless and efficient process for customers. IoT drives the development of smart homes & smart factories, and the backbone of these technologies are semiconductors. The main chips used in IoT are MCUs, but they are 1/3 the size of the MCUs used for smartphones. The significant decrease in size of the chip creates a high risk of electromagnetic interference (EMI), which is when electromagnetic waves cross each other; this can cause a device to stop functioning immediately. Semi manufacturers need to make improvements in EMI software in the early stages of the design process, creating significant barriers to enter into the market.

- Although it is tough to enter, IHS Markit predicts IoT to be the largest growth driver for semis over the next decade, with 125 bn devices connected by 2030. The IoT chip market is expected to grow at a 19.0% CAGR to \$79 bn by 2025, according to Yahoo. Key market players include NVDA, AMD, INTC, NXPI, and Samsung.

## Smarter & Smaller Semis

Thanks to IoT technology, the smart home was created, allowing homeowners to control all home applications by clicking a few buttons on their smartphones. The devices are mainly connected through wireless systems such as Wi-Fi to monitor the home's heating, lighting, audio/visual, and security. Although the technology will allow homeowners to monitor their entire home easily and cost-effectively in the long run, the cybersecurity threat and upfront costs of a smart home worry investors.

- High spending levels may slow down during a time of tightening consumer budgets and weakening residential real estate markets. According to Deutsche Bank, Smart Home is at most risk for a correction due to a weakening consumer budget and worries over security risks. Many semi companies will have to move from suppliers to solution providers because customer data is within easy reach of a hacker. On the other hand, other companies on the Street believe smart home demand will continue due to new technology products, WFH being here to stay, and Wearables delivering valuable data to monitor customers health. If a customer were to go all in on Smart Home applications, it would cost ~\$12,500.

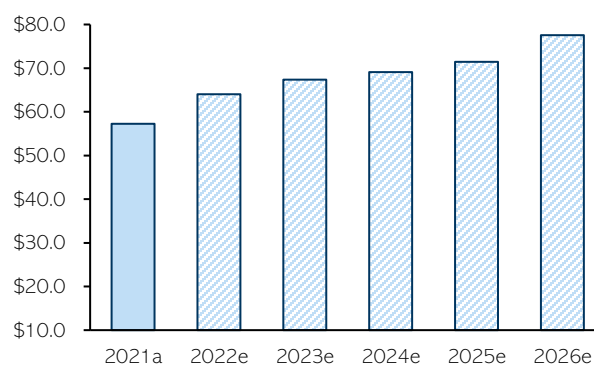
## Adapting to the New Way of Manufacturing

Smart factories emerged through Industry 4.0 & 5.0, connecting physical assets to the cloud to boost manufacturing and productivity processes. Industry 4.0 is the idea of making equipment do human work through machine learning technology, while Industry 5.0 focuses on how to get machines to improve the quality of life and sustainability of the workplace. The smart factory product market is expected to grow at a 12.2% CAGR to \$260 bn by 2030. About 86% of manufacturers believe smart factories will be the main driver of competitiveness in the next five years, and

83% believe they will transform the way products are made. Because of the Smart Factory's natural segue to competitive advantages, demand will grow even stronger as businesses follow in each other's footsteps. ***A Smart Factory will create a 20% increase in efficiency, 30% improved product quality, 30% reduced costs, and 10% improved sustainability, leaving any business that does not adapt behind.***

The number of installations of industrial robots has been increasing at a fast pace. In 2021, the number of robots introduced to manufacturing factories increased by 16.2%, which is expected to grow at a 6.0% CAGR through 2024. China, which is the hub of global manufacturing, installs ~5x more industrial robots than the 2<sup>nd</sup> and 3<sup>rd</sup> largest installers in Japan and the US. According to BBC News, the growth in robotics is expected to take away 75 mn jobs from humans by the end of 2022, but is simultaneously expected to bring in 133 mn new jobs.

Industrial Chip Market Size (bn)



Source: Bloomberg



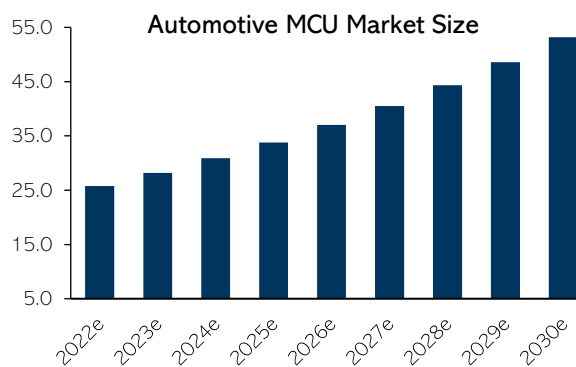


## CATALYSTS & DRIVERS

### Putting Sales in Turbo Speed

As the market penetration of EVs accelerates, NXPI is poised to reap the rewards. The Company has a clear advantage in several key automotive end markets. Its strategy of disciplined expansion has allowed it to enter into very favorable markets where it has a clear technological lead. Its nimble business model has allowed the Company to achieve strong gross margins, which afford NXPI ample opportunity to reinvest in its business. Given NXPI operates in favorable end markets, NXPI boasts very strong tailwinds allowing its cutting-edge products to thrive.

- Seasonally adjusted annual rate (SAAR) penetration of EVs, or the share of EVs as a percentage of total auto sales, was 20% at the beginning of CY'22, an increase in penetration rate of 3% from 3Q'21. Management expects this figure to reach 30% by the beginning of 2023. As auto producers make due on the EV investments, demand for automotive semiconductors will continue to surge.
- Having the second largest market share, NXPI's battery management system (BMS) solutions are another area of accelerating growth. BMS controls charging and power distribution for EV batteries to ensure passenger safety and sufficient supply of electricity. In 2021, its BMS offerings brought in \$200 mn in top-line and are projected to increase to \$500 mn by 2024, representing a ~36% CAGR. The Company's BMS solutions are currently used by 9 out of the top 20 automakers, including GM, TSLA, and VW. These client relationships afford NXPI the ability to cross sell its other product offerings to the largest automakers in the business.
- A larger portion of automobile input costs are going towards semiconductor products. According to Gartner, the average semiconductor cost per vehicle will be \$1,000 by 2026, a 100% increase from 2020. As automobiles grow more complex, more powerful semiconductors are needed to manage data and electrical distribution. NXPI's Automotive Zonal Controller integrates a car's suite of electronic capabilities by connecting the vehicle's electrical components to an electronic control unit. This is where a more powerful series of MCU handles all of the car's tasks, affording the system a more hierarchical structure to better manage its complexity. NXPI had \$300 mn in Zonal sales in 2021 and expects to grow that figure to \$600 mn by 2024. The Automotive Zonal Controller sales account for 50% of the Company's total MCU sales. Management said growth will accelerate after 2024 as some contracts don't kick in until 2025.
- An emerging trend within the automobile market is the adoption among automakers of ADAS systems. These technology-enabled safety systems are meant to keep drivers and passengers safe. With 55% of consumers citing safety as the most important factor in buying a car, ADAS is the industry's response. It is meant to aid in the driving process, and ultimately save lives. It uses a series of internal and external sensors to make decisions for the driver when it appears like the driver is going to crash. Vehicles undergoing the government-sponsored New Car Assessment Program (NCAP) are increasingly required to use ADAS systems in order to achieve a favorable safety rating. NXPI currently has a 50% market share in this market due to its Automotive Radar Systems products. In CY'21 the Company booked sales of \$600 mn and expects that figure to reach \$1.2 bn by CY'24, representing a ~26% CAGR and outpacing TAM growth of 14.1%.



Source: Precedence Research

NXPI's existing portfolio of semiconductor technology and cutting-edge solutions are rapidly gaining market traction. ***The accelerated growth drivers including BMS, Automotive Zonal Controller, and ADAS products currently make up a third of the automotive segment's revenue. By 2024, they will make up almost 50% of the segment's revenue and will continue to grow at a 20% CAGR.***



## It's a Numbers Game

NXPI has been developing MCUs since 2013, and it is the industry-leading supplier of general purpose MCUs within the Industrial end market. The Company produces thousands of different MCUs ranging from 8 bit to 32 bit, as well as giving customers the choice between traditional and crossover MCUs. Its dynamic portfolio makes it a one-stop-shop for customers needing semis for several different applications. NXPI's consistency in delivering chips and ability to communicate directly with large OEMs continues to set it apart from competitors. NXPI has over 25,000 customers, with some of the most important being Microsoft (Cloud), Schneider Electric (Smart Factory), and ChargePoint (EV Infrastructure). ***We believe NXPI's dynamic portfolio and industry-leading connectivity devices allow it to capitalize on the industry-wide tailwinds displayed in the Industrial & IoT end markets.***

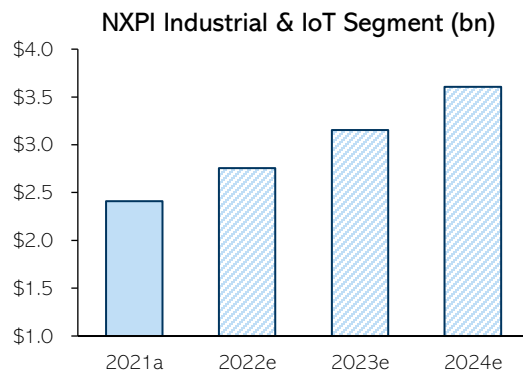
### Connecting with Others

Whether its connecting machines in a smart factory or products in a smart home, the processor is at the core of every connection (Exhibit VIII). Currently, NXPI's i.MX RT Series is the industry's first crossover MCU; it combines the framework of high-end application processors with low end traditional MCUs, creating a lower cost and more advanced chip. Crossover MCUs' prices vary according to the amount of memory storage they hold.

- The crossover MCU will create Human Machine Interface allowing the customer to control physical elements in their home, such as temperature just with the use of their voice. ***These chips will become extremely prevalent in the Vision and Audio end market, which NXPI projects to grow at a 35.0% CAGR through 2024, increasing annual revenue by \$500 mn.***

Although the crossover MCU will help generate growth for NXPI, the Company's growth in the factory automation end market isn't expected to come from a specific chip. The growth will come from the connectivity of all chips, leading machines to increase efficiency all around. Through software stickiness, NXPI will be able to capitalize on industry advancements such as Wi-Fi 6e connectivity and Time-Sensitive Networking (TSN). Management continues to emphasize that altogether, these will serve as significant growth drivers for NXPI in factory automation.

- The first decision a manufacturer makes is the type of processor it chooses, leading to what is called software stickiness. Software stickiness is the idea that a developer will not replace the software it is using because it takes too much time, money and energy. This proves that NXPI's existing market share is critical and will not be going away anytime soon. NXPI is now prioritizing building out its customer-base to take advantage of this.
- Previous levels of Wi-Fi have not been strong enough to support the Industry 4.0 revolution, but in 2020 Wi-Fi 6e was introduced providing customers with greater range and speed for industrial grade performance. The range of Wi-Fi 6e is ~600 ft, as compared to Wi-Fi 5 which has a range of ~75 ft. With Wi-Fi 6e, NXPI can connect all of its pre-existing chips to devices and have them work cohesively just by inserting an access point in the manufacturing facility.
- TSN is the newest way for a factory to improve production. It provides manufacturers with a solution to guarantee a specific efficiency rate through communication of the factories network. A MCU will collect the data and transmit it to a Wi-Fi 6e link for the most efficient algorithm to be detected.



Source: Company Filings

According to BofA, wage inflation historically served as a catalyst for companies to invest in productivity enhancing initiatives. Considering that wages are growing 79% higher than average right now, every business is concerned with preserving long-term margins. Therefore, companies are expected to increase capex investments into eventual cost-saving initiatives, like factory automation. ***NXPI is well positioned to capture these tailwinds and will be able to grow revenue at 2.3x the current existing industrial market growth. Its Industrial & IoT revenue is expected to grow at a 14.0% CAGR to \$3.3 bn by 2024.***

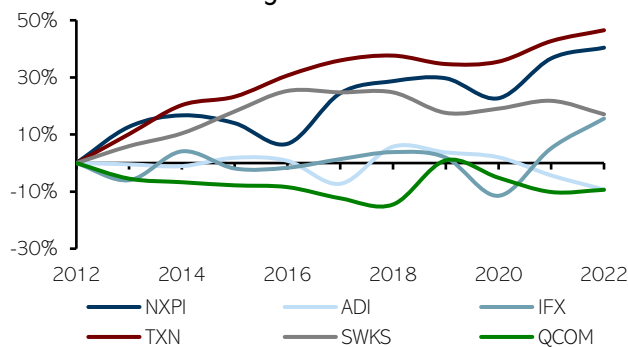


## A “Structurally Fortified” Company

Our team thought it would be helpful to provide the Fund with additional information about NXPI's business that does not necessarily fall into any of the Company segments but still highlights the strength of the business. Due to the increasing complexity of the semiconductor industry, a consistent yet agile business model is important for success. NXPI is well adapted for the intricacies and competitiveness of the industry, which we believe will contribute to its success in our investment horizon. Its early investments in structural changes to its business are just beginning to pay off. As investors realize NXPI's strengthening fundamentals, its multiple will return back to fair value.

- As recently as this September, management indicated a stubbornly low inventory. It currently has a 1.6 month supply of inventory, ~56% below its long-term goal of 2.5 months. This signals the continued strength in demand for NXPI's products. The average supply of inventory among peers ADI, TXN, and INX is 4.3 months, illustrating industry preference for NXPI's products. The low inventory will allow the company to respond quicker to changes in demand, allowing it to navigate the uncertainty that is present in parts of the semi industry.
- Despite slowdown concerns, all signs point towards demand far exceeding supply. It reported that 80% of its product portfolio remains at 52-week lead times. The Company's backlog has also held steady. After accounting for double orders and expected cancellations, management estimates that it can only supply 80% of the orders in its backlog at current capacity. This is indicative of the continued demand within NXPI's end markets.
- According to the IDC, there is structural underinvestment in chips between 16 to 90 nm, due to the lower manufacturing ROI for these chips. The 16 to 90 nm range is where NXPI primarily operates, partly explaining the inability to fully satisfy demand. We believe this will have the effect of prolonging semiconductor demand within NXPI's automotive and industrial segments. This is advantageous as it negates the risk of a boom-bust cycle semiconductor companies typically experience, and it ensures strong top and bottom-line contributions.
- While this does provide pricing power to NXPI, its business model does not rely on rapidly increasing ASP. In FY'21 revenue grew 28%, while pricing only expanded by low single digits. The Company continuously demonstrates its ability to grow organically and expand margins during periods of modest price increases.
- Additionally, NXPI leverages a very flexible spending model, currently having 70% variable costs and 30% fixed costs. This represents a large change from 10 years ago when the Company had 70% fixed and 30% variable costs. Strategically shifting its cost structure has undoubtedly contributed to NXPI's impressive margin expansion since its IPO. A decade ago, margins were ~45%, and now they are nearing 57%. This business transformation speaks well to management's forward-looking mindset. Further contributing to the margin expansion is the increased reliance on third-party fabricators. It currently outsources 60% of its wafer fabrication, which gives NXPI tremendous opportunity to respond to changes in demand. The Company expects that this figure could rise to 75% eventually, allowing it to scale production capacity up and down without building out the capacity themselves.

Gross Margin for NXPI and Peers



Source: Bloomberg

## Playing to Win

NXPI has resilience baked into its business model. Not only has it tailored its product portfolio to high barrier-to-entry markets, but it has also ensured its financial profile can withstand ebbs and flows in demand that are typical of the industry. Management's disciplined attitude has ensured successful organic growth through 2024 and beyond. It possesses a countercyclical attitude towards introducing products. ***NXPI will only enter markets where it sees long-term growth potential, an opportunity to achieve a 1.5x relative market share, and an ability to meet a 45% hurdle rate.*** NXPI is a refreshing alternative to the reactive business models of most semiconductor companies. On top of its disciplined growth strategy, it offers investors value through its fundamental structure.



## UNDERVALUATION & THESIS

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### Tech is Cheap, but Don't Weep

Amid the current bear market, technology stocks are facing a particularly tough correction in 2022 thus far. On a YTD basis, the Nasdaq Composite has underperformed the S&P 500 by 7.6%, and unfortunately, there is not one sub-industry that is perfectly immune to the macro. Our team recognizes it will be difficult to pick stocks that will be winners in the near term, so instead, we focused our screening on names that have undeniable secular tailwinds that will enable multiple expansion in the longer term. We are confident that NXP Semiconductors N.V. (NXPI) checks off our initial criteria to find a company with stable margins, predictable cash flows, and diversified end-market exposure, while also granting the Fund necessary diversification outside of software and service names. **Currently, NXPI is trading at 10.8x NTM P/E, representing a 45.2% discount to its 3-year median of 19.7x.**

**Cycle Obscurity:** This year, many investors have raised concerns regarding the current state of the semiconductor cycle. When COVID-19 hit, supply-chain disruptions caused the demand for chips to skyrocket, leading to a 21-month rally in semi stocks following the market's bottom in 2020. The PHLX Semiconductor Index (SOX), which represents the 30 largest chip companies in the US, is down 35.4% YTD. Given the interconnected manufacturing processes across the industry, NXPI's multiple has sharply contracted with its peers since the start of the year. The looming fears over a potential downturn serve as the primary reason for NXPI's current undervaluation.

- Despite falling victim to the broader industry sell-off, NXPI has beat on top and bottom-line three times this year. In 2Q'22, NXPI maintained margins within management's range of 55 – 58% for the fourth consecutive quarter, and it posted revenue growth of 24.9% over 1H'21, yet the stock still slid 1.7%. Given the Company's bullish evidence of continued strong end-user demand, we believe investors are unjustly reacting to NXPI.
- Undoubtedly, the demand for chips skyrocketed throughout the pandemic, which may appear to be inflating median multiples. However, NXPI is also trading at an attractive discount to its median 1, 5, and 10-year NTM P/E. Moreover, to factor out the COVID-19 run-up, our team evaluated NXPI's median multiple over the 10-year period leading up to Dec'19 to be 12.9x, to which it still trades at a 16.3% discount to today.

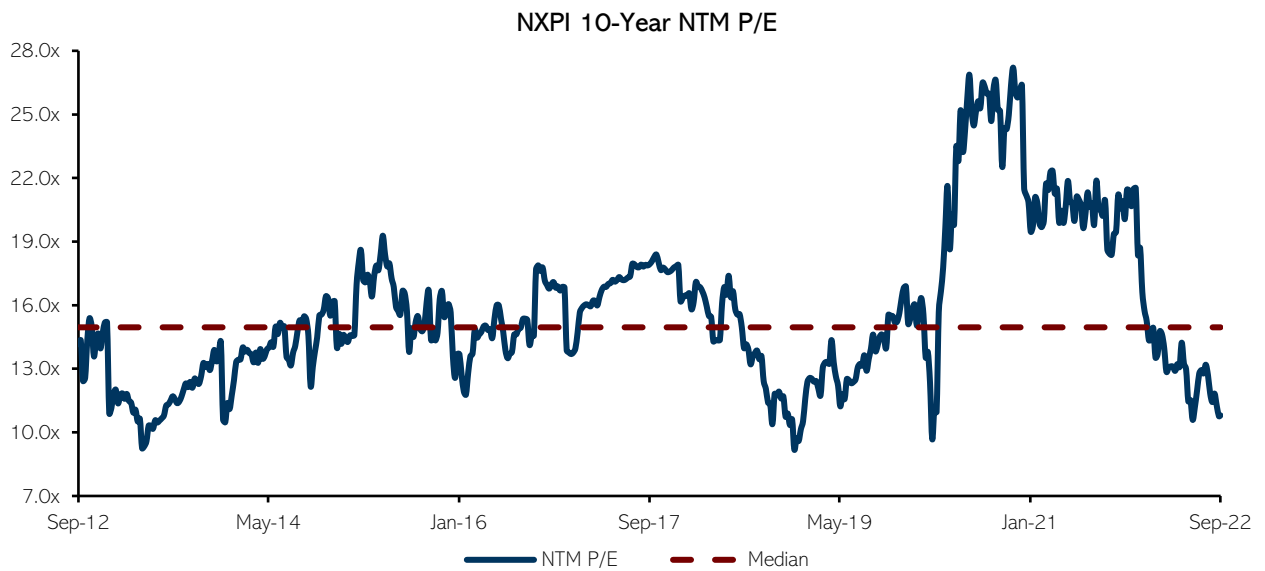
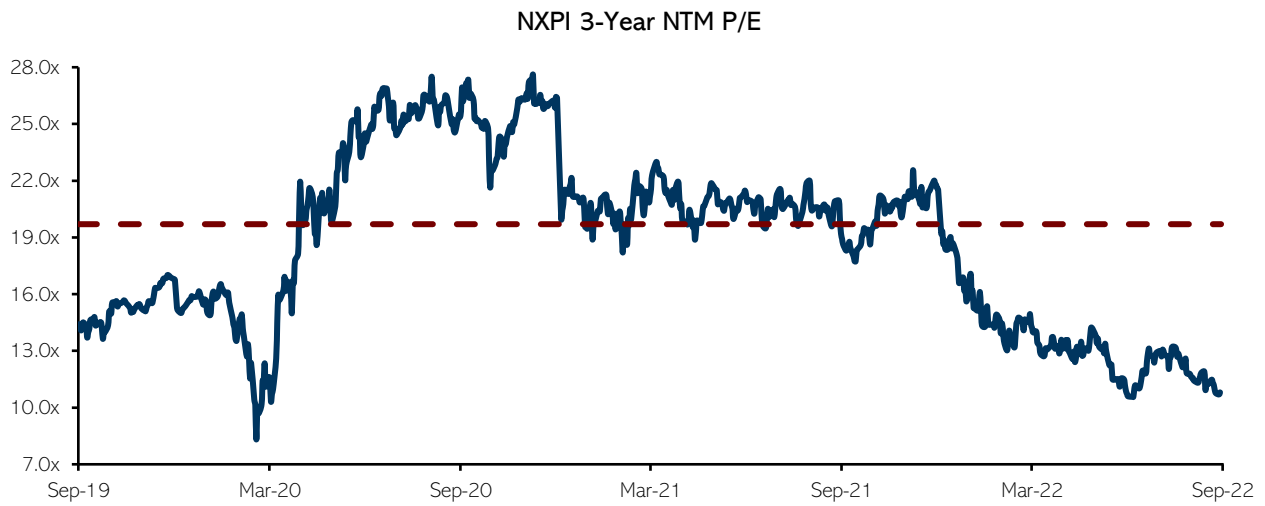
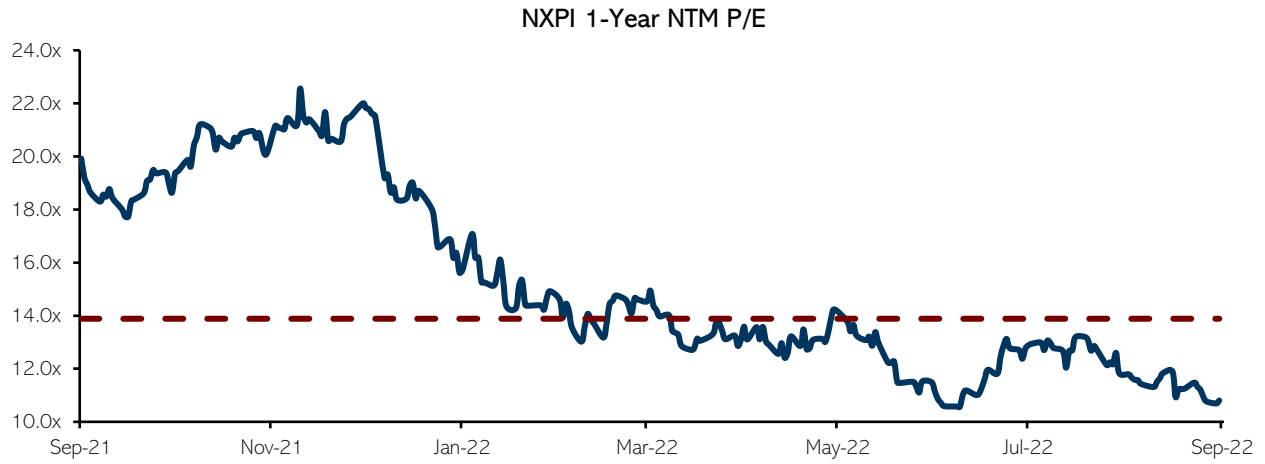
Among the several publicly-traded chip companies, we believe one of the major differentiators moving forward will be end market exposure. Looking forward, companies that serve automotive and industrial end markets are best positioned to capture growth as the world is witnessing the rise of EVs, machine automation, and smart connectivity trends. During the Deutsche Bank Tech Conference held on August 31<sup>st</sup>, NXPI reiterated the notion it previously set forth that demand continues to strongly outpace its ability to supply its core end markets, auto and industrial, which account for more than 70% of sales. In fact, management laid out that even after de-risking its backlog, which includes eliminating stale and double orders, the Company only has the capacity to serve 80% of true demand, indicating market penetration opportunities in the years to come. On the IoT side, NXPI now offers a full suite of digital, analog, and connectivity solutions as well. Our team firmly believe that the stock's current discount is overpricing weakness in its peers' personal electronic segments, and overlooks its high RMS leadership.

Investors fear a potential cycle downturn, which is usually indicated by rising inventory levels. However, while some of NXPI's peers reported this in recent earnings, the Company has implemented a conservative approach to inventory management to mitigate this risk. It signs non-cancelable/non-returnable (NCNR) purchase orders with customers, providing them with the benefit of supply assurance and NXPI with long-term committed demand. At Citi Tech Conference in early September, management confirmed that NCNR orders among auto and industrial customers extend into FY'23 and are at levels greater than it can service. In addition, during its 2Q'22 earnings call, the Company revealed its inventory channel levels were at 1.6 months, well below its long-term goal of 2.5 months; this marked the 7<sup>th</sup> consecutive quarter of tight supply, which signals robust demand amid fears of a cycle downturn.

***Overall, we believe NXPI is in a significantly more defensive position than its semi peers, and investors are not appreciating the Company's diligence in managing inventory, prices, and gross margins. By leveraging its hybrid manufacturing model and diverse market exposure, NXPI will optimally capitalize on tailwinds and offset any potential slowdown in consumer-facing markets moving forward.***



### Valuation Graphs



Source: Bloomberg



## PEER GROUP ANALYSIS



**Infineon Technologies AG (IFX)** is the largest supplier of chips to the automotive industry, holding about 13.2% of the total market share. The Company is based out of Munich, Germany and is traded on the OTC markets. It breaks its revenue down into four segments: Automotive (43.8%), Power & Sensor Systems (29.5%), Industrial Power Control (13.9%), and Other (12.7%). IFX generated \$11.1 bn in revenue in FY'21.



**Analog Devices, Inc. (ADI)** designs, develops, and manufactures semiconductor devices. The Company breaks down revenue into four segments: Industrial (54.8%), Automotive (17.1%), Communications (16.4%), and Consumer (11.7%). Its products include data converters, amplifiers, sensors, and radio frequency ICs. The Company is headquartered in Wilmington, MA and has 32.7% sales exposure to the U.S.



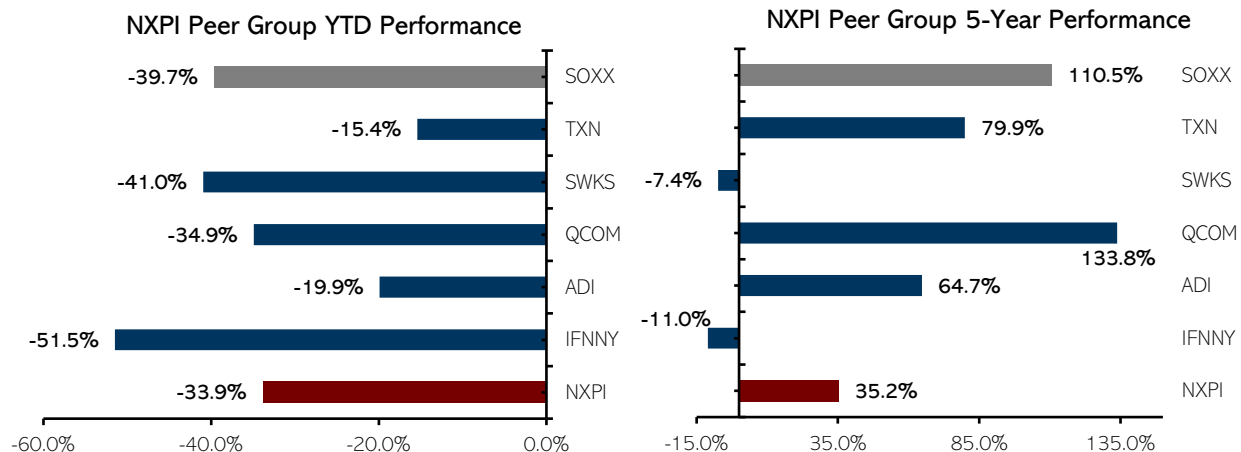
**QUALCOMM, Inc. (QCOM)** is a developer and designer of semiconductor products, it operates through three business segments: CDMA Technologies (80.9%), Technology Licensing (18.9%), and Strategic Initiatives (0.2%). The CDMA Technologies segment includes the development of ICs and software systems that are based on networking. The Technology Licensing segment provides its own Intellectual Property to other companies. In the Company's recent investor day, it announced its expansion into automotive by increasing its chip pipeline from \$10 bn to \$30 bn since Jul'22.



**Skyworks Solutions, Inc. (SWKS)** designs and manufactures analog semiconductors. The Company is a leader in developing wireless networks, such as 5G and IoT. SWKS provides chips to customers in aerospace, automotive, connected home, industrial, and mobile. It operates in two business segments: Distributors (88.9%) and Direct Customers (11.1%). SWKS has ~65% of its sales coming from the U.S and has ~4,500 patents.



**Texas Instruments, Inc. (TXN)** designs and manufactures semiconductors for the use of industrial, automotive, and personal electronics. The Company operates through three business segments: Analog (76.6%), Embedded Processing (16.6%), and Other (6.8%). The Analog semiconductors change real-world signals, such as sound and temperature. The Embedded Processing segment is designed to increase the power and lower the cost of its chips. TXN generates ~10 % of its revenue from the U.S.



Source: Bloomberg



Primary Peer Group																	
Ticker	Market Cap	Enterprise Value	Sales		EPS		EBITDA Margin		Profit Margin		Enterprise Value /		Sales		Price / Earnings		
			LTM	2022E	LTM	2022E	LTM	2022E	LTM	2022E	LTM	2022E	LTM	2022E	LTM	2022E	
			EBITDA														
NXP Semiconductors N.V.	NXPI	\$41,932	\$49,801	24.3%	20.3%	151.3%	108.4%	36.9%	41.0%	19.8%	28.1%	10.4x	9.1x	3.9x	3.7x	16.7x	11.2x
Infineon Technologies AG	IFX	31,831	34,696	24.1%	26.4%	141.6%	118.4%	32.1%	33.0%	14.6%	17.8%	7.6x	7.5x	2.5x	2.5x	15.8x	12.8x
Analog Devices, Inc.	ADI	76,056	80,784	70.7%	62.9%	(20.0)%	173.5%	48.8%	51.7%	17.0%	41.4%	14.2x	13.1x	7.0x	6.8x	38.8x	15.4x
QUALCOMM Incorporated	QCOM	140,353	149,050	29.4%	31.8%	41.0%	59.1%	39.8%	42.8%	30.5%	32.2%	8.5x	7.9x	3.4x	3.4x	10.7x	9.9x
Skyworks Solutions, Inc.	SWKS	16,077	17,817	13.3%	7.2%	(7.1)%	23.9%	39.5%	46.0%	24.1%	33.2%	7.8x	7.1x	3.1x	3.3x	12.0x	8.9x
Texas Instruments Incorporated	TXN	148,633	147,490	16.9%	10.0%	27.4%	15.9%	57.4%	56.8%	43.8%	44.2%	12.9x	12.9x	7.5x	7.3x	17.6x	16.7x
High		\$148,633	\$149,050	70.7%	62.9%	141.6%	173.5%	57.4%	56.8%	43.8%	44.2%	14.2x	13.1x	7.5x	7.3x	38.8x	16.7x
Mean		82,590	85,967	30.9%	27.7%	36.6%	78.2%	43.5%	46.1%	26.0%	33.8%	10.2x	9.7x	4.7x	4.6x	19.0x	12.7x
Median		76,056	80,784	24.1%	26.4%	27.4%	59.1%	39.8%	46.0%	24.1%	33.2%	8.5x	7.9x	3.4x	3.4x	15.8x	12.8x
Low		16,077	17,817	13.3%	7.2%	(20.0)%	15.9%	32.1%	33.0%	14.6%	17.8%	7.6x	7.1x	2.5x	2.5x	10.7x	8.9x

Company	General Statistics				Returns Analysis			2021A Leverage Analysis			2021A Coverage Analysis			Liquidity Profile		Credit Profile	
	Ticker	Tax Rate	Beta	Dividend Yield	ROIC	ROE	ROA	Total Debt /			EBITDA / Int. Exp.	(EBITDA - Capex)/Int.	EBIT / Int. Exp.	Quick Ratio	Current Ratio	S&P	Outlook
								Cap	EBITDA	Equity							
NXP Semiconductors N.V.	NXPI	12.5%	1.25	2.1%	19.6%	33.4%	9.6%	0.6x	2.8x	1.6x	10.6x	8.4x	7.1x	1.53	2.13	BBB	Stable
Infineon Technologies AG	IFX	10.9%	1.62	1.1%	13.1%	15.8%	7.1%	0.4x	2.1x	0.6x	20.8x	12.6x	11.5x	1.27	1.86	BBB	Stable
Analog Devices, Inc.	ADI	13.2%	1.16	2.1%	6.7%	7.7%	5.6%	0.2x	2.2x	0.2x	17.5x	15.6x	11.4x	1.24	1.94	A-	Stable
QUALCOMM Incorporated	QCOM	12.0%	1.25	2.4%	45.9%	106.2%	22.0%	0.6x	1.4x	1.6x	20.7x	17.3x	17.5x	1.34	1.68	A	Stable
Skyworks Solutions, Inc.	SWKS	6.3%	1.21	2.5%	20.3%	25.2%	11.8%	0.3x	1.2x	0.5x	154.3x	106.7x	124.1x	2.70	4.35	BBB-	Stable
Texas Instruments Incorporated	TXN	12.9%	1.02	2.8%	51.1%	68.0%	28.4%	0.4x	0.8x	0.6x	54.6x	41.2x	49.0x	4.45	5.33	A+	Stable
High		13.2%	1.62	2.8%	51.1%	106.2%	28.4%	0.6x	2.2x	1.6x	154.3x	106.7x	124.1x	4.45	5.33		
Mean		11.1%	1.25	2.2%	27.4%	44.6%	15.0%	0.4x	1.5x	0.7x	53.6x	38.7x	42.7x	2.20	3.03		
Median		12.0%	1.21	2.4%	20.3%	25.2%	11.8%	0.4x	1.4x	0.6x	20.8x	17.3x	17.5x	1.34	1.94		
Low		6.3%	1.02	1.1%	6.7%	7.7%	5.6%	0.2x	0.8x	0.2x	17.5x	12.6x	11.4x	1.24	1.68		



## RISKS TO INVESTMENT THESIS

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### Geopolitical Tensions

Considering the industry's critical standing in global trade, any geopolitical conflict raises many concerns for its future trajectory. Right now, investors are focused on the tensions between China and Taiwan, as the independence of the latter nation is at risk. Taiwan is home to the most-advanced leading-edge foundry in the world, TSM, which plays an essential role in the semi supply-chain. The risk lies in the fear that an invasion of the island would render TSM's facilities inoperable and thus halt essential production. NXPI currently sources ~60% of revenue from third-party foundries, with approximately 10 – 20% coming from TSM, per our sell-side analyst. Although there are many advantages of going fabless, such as lower fixed costs and increased focus on R&D, there is a clear risk-reward tradeoff: lower operational control and supply disruptions in the face of political conflict.

- *Mitigant:* While no single investor or company holds the power to influence international relations, the industry can mitigate this risk by shortening supply-chains. Recent legislation for chip stimulus will help the US and Europe to onshore more production, which will aid NXPI in the long-run. For now, the obsolescence of just-in-time inventory management and use of NCNR orders gives NXPI major visibility into its supply one year out.

***While we do not believe this specific political risk can be accurately modeled in, we thought about a scenario in which NXPI is forced to build out internal operations. Therefore, we increased capex investments and operating expenses to squeeze EBIT margins in our bear case.***

### Personal Electronics Slowdown

Consumer sentiment on discretionary items remains a key topic of investor conversation ever since inflation hit 40-year highs this past June. During the 2Q earnings season, MSFT, DELL, AAPL, and Samsung all expressed slowing growth for their products, which left chipmakers heavily exposed to personal electronics with large piles of inventory. The slowdown in personal electronic spend is expected to continue through 2H'23, with the market currently pricing in a contraction of ~5% in related chip demand throughout 2022. NXPI is susceptible to this weakening seeing as 13% of sales come from Mobile and the IoT business is slightly exposed the broader PC market.

- *Mitigant:* Already, NXPI's relatively small position in this end-market will allow it to weather any slowdown much better than higher exposed names, such as AMD and NVDA. Management also highlighted in 2Q'22 earnings that its Mobile business is more biased towards premium tier members as opposed to the low-end handset market, which is where most weakness was documented. Plus, it is a true leader, meaning it holds 50% more market share than its closest competitor, in more than 80% of this unit. It has achieved this by combining its leadership in core franchises, like secure wallet, with growth opportunities, like ultra-wideband solutions.

***In our base and bear case, we modeled a 2.3% and 0.4% Mobile revenue CAGR through FY'24 to illustrate cooling consumer demand as a result of inflationary pressure and the fading WFH tailwind.***

### FX Headwinds

Like many semiconductor companies, NXPI generates a majority of sales (87.6%) outside of the Americas. Naturally, this leads to foreign exchange risk, which is heightened right now due to the inflationary environment. With each of the Fed's rate hikes, the Dollar continues to strengthen against foreign currencies; for instance, over just the last month, the Chinese Yuan has lost 4.9% of its value and the Euro remains below parity as well. Also, this has greater implications for companies with major overseas operations as a strong Dollar shrinks their competitive pricing edge.

- *Mitigant:* To manage fluctuations in international currencies, NXPI uses derivatives that assess interest rates, forex rates, and commodity spot and forward rates. With this hedging strategy, NXPI can limit potential hits to its top-line. In FY'21, forex rates resulted in a \$5 mn income profit versus a loss of \$16 mn in FY'20.

***We modeled gross margins on the low end of Management's range to compensate for adverse effects to top-line. In our bear case, we also modeled higher non-operating income expenses to reflect FX losses.***





## VALUATION ANALYSIS

### DCF Assumptions

In our FY'22 base case, we assume that revenue growth slows down in the second half, coming off the strongest two quarters in the Company's history. Specifically, we assume that growth will decelerate in the Automotive and Industrial & IoT segments due to supply chain constraints. Also, since the Mobile segment is facing the weakest macro backdrop, we modeled negative growth through 1Q'23, or until inflationary pressures should start to ease up on the consumer. We expect the CI&O segment to remain relatively flat through the next twelve months. Altogether, these assumptions yield a 10.1% revenue CAGR through FY'24, right at the midpoint of management's 8 – 12% range. We assume SG%A costs remain in the 8 – 9% range as NXPI steadily hires more engineers and direct labor to keep up with increasing production. Per guidance, R&D expense remains 16.0% of sales at minimum in order to keep delivering new solutions to the market. As the Company prioritizes working capital management, we assume it reaches its goal of 95 DIO, but it does not achieve this until 2H'23 as we have not seen signs of decreasing demand. We also modeled capex to reach 8.0% of sales, as we assume NXPI will continue to improve its laboratories and manufacturing facilities. This figure is slightly above historical yearly averages, but in-line with 1H'22, which is more representative of the future environment. In terms of capital allocation, we are confident in management's ability to return FCF to shareholders, so we modeled ~\$3.6 bn worth of buybacks through FY'24 and YoY dividend increases. Overall, we remained conservative in our projections relative to the Street.

Discounted Cash Flow	2019	2020	2021	1Q22	2Q22	3Q22e	4Q22e	2022e	2023e	2024e	2025e	2026e
Revenue	\$8,877.0	\$8,612.0	\$11,063.0	\$3,136.0	\$3,312.0	\$3,421.7	\$3,507.5	\$13,377.3	\$14,264.6	\$14,783.7	\$15,468.7	\$16,283.5
EBITDA	2,047.0	1,717.0	3,330.0	999.0	1,064.0	1,182.3	1,205.2	4,450.5	4,777.5	5,048.7	5,327.8	5,656.6
EBIT	641.0	418.0	2,583.0	873.0	943.0	918.7	943.3	3,678.0	3,700.9	4,006.7	4,203.4	4,459.3
Income Tax Benefit (Expense)	(19.0)	79.0	(274.0)	(102.0)	(132.0)	(135.2)	(138.9)	(508.1)	(653.3)	(707.9)	(742.7)	(788.0)
NOPAT (EBIAT)	\$622.0	\$497.0	\$2,309.0	\$771.0	\$811.0	\$783.4	\$804.4	\$3,169.9	\$3,047.6	\$3,298.8	\$3,460.7	\$3,671.3
% YoY Growth		(20.1%)	364.6%					37.3%	(3.9%)	8.2%	4.9%	6.1%
Depreciation & Amortization				135.0	134.0	168.4	171.1	608.5	735.9	724.1	823.9	914.2
Stock-Based Compensation				89.0	89.0	95.8	105.2	379.0	412.0	440.6	461.0	485.2
Capital Expenditures				(280.0)	(268.0)	(205.3)	(210.5)	(963.8)	(998.5)	(1,182.7)	(1,237.5)	(1,302.7)
Goodwill Impairment				-	-	-	-	-	-	-	-	-
(Increase)/Decrease in Working Capital				(7.0)	(129.0)	(159.1)	(29.0)	(324.1)	(257.2)	(130.3)	(68.6)	(81.9)
(Increase)/Decrease in LT Items				-	-	(37.0)	(37.7)	(74.7)	(158.5)	(83.2)	(86.6)	(90.0)
Unlevered Free Cash Flow				\$708.0	\$637.0	\$646.3	\$803.6	\$2,795.3	\$2,781.3	\$3,067.3	\$3,353.0	\$3,596.2
% YoY Growth									(0.5%)	10.3%	9.3%	7.3%
Discountable Unlevered Free Cash Flow				\$0.0	\$0.0	\$646.3	\$803.6	\$1,449.9	\$2,781.3	\$3,067.3	\$3,353.0	\$3,596.2
Full-Year Discount								0.29	1.29	2.29	3.29	4.29
Mid-Year Discount								0.15	0.79	1.79	2.79	3.79
Discount Factor								0.99	0.94	0.88	0.82	0.76
Present Value of Future Free Cash Flow								\$1,434.8	\$2,628.3	\$2,699.3	\$2,747.9	\$2,744.6
% Growth									83.2%	2.7%	1.6%	(0.1%)

Exit Multiple Method:		Perpetuity Growth (PGR) Method	
Terminal Year EBITDA:	\$5,656.6	Terminal Year FCF:	\$3,596
Exit Multiple:	13.0 x	PGR:	2.3%
Terminal Value:	73,536	Terminal Value:	59,967
PV of Terminal Value:	54,182	PV of Terminal Value:	44,185
PV of Stage 1 Cash Flows:	12,024	PV of Stage 1 Cash Flows:	12,024
Implied Enterprise Value:	\$66,206	Implied Enterprise Value:	\$56,209
(+) Cash & Equivalents:	3,545	(+) Cash & Equivalents:	3,545
(-) Preferred Stock:	0	(-) Preferred Stock:	0
(-) Total Debt:	(11,160)	(-) Total Debt:	(11,160)
(-) Pension Obligations:	0	(-) Pension Obligations:	0
(-) Non-Controlling Interests:	(264)	(-) Non-Controlling Interests:	(264)
(-) Capital Leases:	0	(-) Capital Leases:	0
Implied Equity Value:	\$58,327	Implied Equity Value:	\$48,330
Diluted Shares O/S:	264.7	Diluted Shares O/S:	264.7
Implied Share Price:	\$220.36	Implied Share Price:	\$182.59
% Return:	43.5%	% Return:	18.9%



### Multiples Valuation

NTM P/E					
	14.8x	15.8x	16.8x	17.8x	18.8x
\$9.46	\$140.37	\$149.83	\$159.29	\$168.75	\$178.21
\$10.64	\$157.91	\$168.56	\$179.20	\$189.84	\$200.49
\$11.83	\$175.46	\$187.28	\$199.11	\$210.94	\$222.77
\$13.01	\$193.00	\$206.01	\$219.02	\$232.03	\$245.04
\$14.19	\$210.55	\$224.74	\$238.93	\$253.13	\$267.32

NTM P/E					
	14.8x	15.8x	16.8x	17.8x	18.8x
\$9.46	(8.6%)	(2.4%)	3.8%	9.9%	16.1%
\$10.64	2.9%	9.8%	16.7%	23.7%	30.6%
\$11.83	14.3%	22.0%	29.7%	37.4%	45.1%
\$13.01	25.7%	34.2%	42.7%	51.2%	59.6%
\$14.19	37.2%	46.4%	55.6%	64.9%	74.1%

2009-2018 Full Cycle P/E					
	12.1x	13.1x	14.1x	15.1x	16.1x
\$9.46	\$114.68	\$124.14	\$133.60	\$143.06	\$152.53
\$10.64	\$129.01	\$139.66	\$150.30	\$160.95	\$171.59
\$11.83	\$143.35	\$155.18	\$167.00	\$178.83	\$190.66
\$13.01	\$157.68	\$170.69	\$183.70	\$196.71	\$209.72
\$14.19	\$172.02	\$186.21	\$200.40	\$214.60	\$228.79

2009-2018 Full Cycle P/E					
	12.1x	13.1x	14.1x	15.1x	16.1x
\$9.46	(25.3%)	(19.1%)	(13.0%)	(6.8%)	(0.6%)
\$10.64	(16.0%)	(9.0%)	(2.1%)	4.8%	11.8%
\$12.51	(6.6%)	1.1%	8.8%	16.5%	24.2%
\$13.01	2.7%	11.2%	19.7%	28.1%	36.6%
\$14.19	12.1%	21.3%	30.5%	39.8%	49.0%

Returns Profile			
Methodology		Implied PT	Implied Return
<u>DCF</u>			
25.0%	Exit Multiple	\$220	43.5%
25.0%	Perpetual Growth Rate	\$183	18.9%
<u>Historical Multiples</u>			
25.0%	NTM P/E	\$199	29.7%
<u>Cyclical Multiples</u>			
25.0%	NTM P/E	\$167	8.8%
	Weighted Average	\$192	25.2%

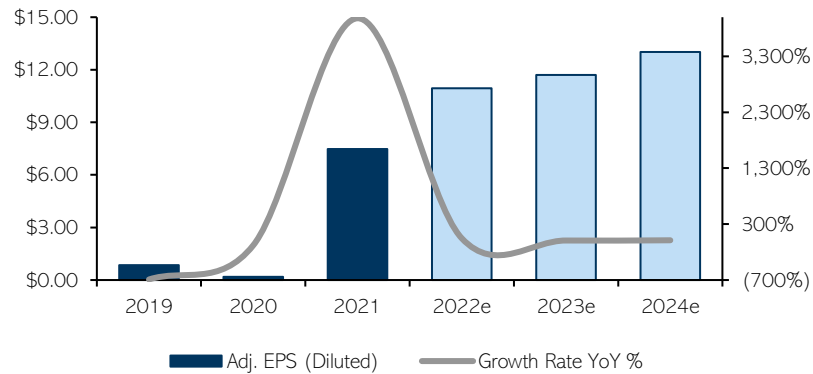


## FINANCIAL ANALYSIS

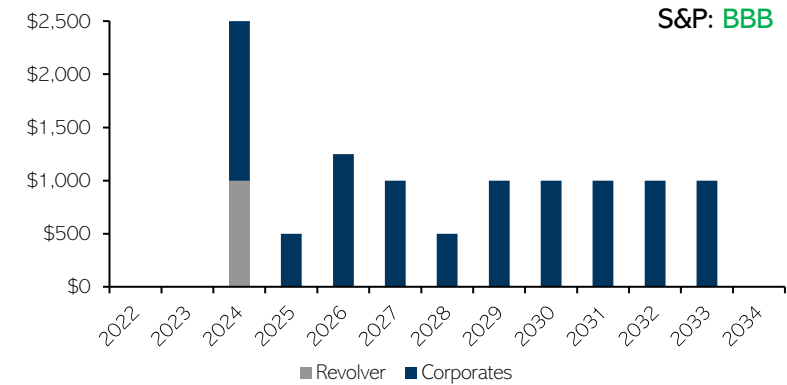
### Revenue Build

Summary	2019	2020	2021	2022e	2023e	2024e	2025e	2026e
Total Company Revenue	\$8,877.0	\$8,612.0	\$11,063.0	\$13,377.3	\$14,264.6	\$14,783.7	\$15,468.7	\$16,283.5
% Growth QoQ		0.0%	0.0%	20.9%	6.6%	3.6%	4.6%	5.3%

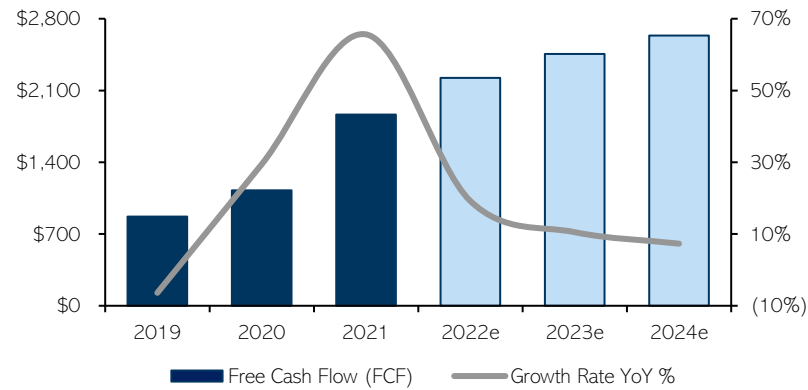
### Earnings Per Share



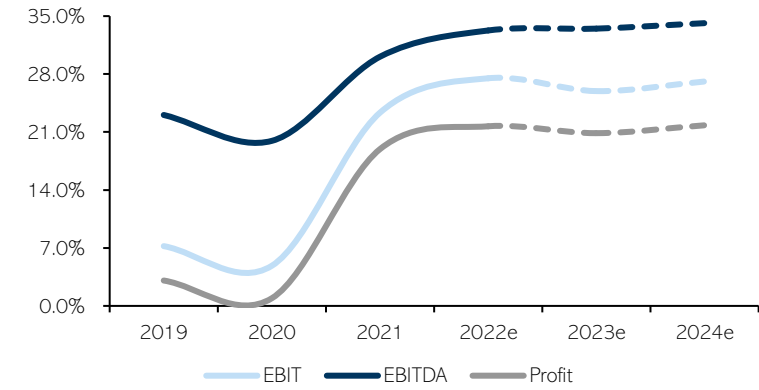
### Debt Distribution



### Free Cash Flow



### Margins





## APPENDIX

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### Exhibit I: Sell Side Discussion Summary

**Analyst: Melissa Weathers | \$205.00 PT | Overweight Rating**

- **A More Defensive Play:** Similar to our story, Deutsche Bank is very keen on NXPI's exposure to hot end-markets, especially during this difficult-to-navigate period of the semiconductor cycle. Melissa highlighted the fact that even amongst its auto and industrial facing peers, NXPI is one of the safest plays right now given the structural improvements its made over each cycle in the past decade. Specifically, she pointed to management's ability to improve margins by more than 1,100 bps as well as the Company's hybrid manufacturing model; these business transformations will provide meaningful downside protection to margins should NXPI face an industry correction. Another critical aspect that gives NXPI an edge over auto and industrial peers is its penetration into faster growing sub-markets. It deliberately targets the next generation of technologies, which currently includes EVs and autonomous driving solutions. Melissa mentioned that even in a case where global car production slows down, the Company will see revenues grow because chip content per vehicle is increasing, which it can take advantage of unlike suppliers for primarily ICE cars.
- **Broad-Based Portfolio:** Although there are evident application areas across each business segment that will accelerate growth over the next few years, Melissa noted that a handful of products will not be the sole needle movers going forward. NXPI does not have high product concentration, so it is important to maintain a holistic mindset when evaluating the innovation it brings to market. That being said, investors do tend to focus on certain businesses, such as BMS and microcontrollers, where NXPI is a leader.
- **Pros and Cons of Hybrid Manufacturing:** As mentioned, NXPI uses both third-party and in-house fab plants to manufacture the necessary chip components. Historically, this aided the Company's margin expansion as it provides flexibility and reduces capital outlays, which means NXPI does not have to bear increased depreciation costs. This also allows it to easily pull capacity from foundry partners in periods of low demand. On the flip side, this model can limit growth during supply shortages because NXPI operates at the mercy of its suppliers.



**Analyst: Nick Doyle | \$225.00 PT | Overweight Rating**

- **Changing Cycles:** We wanted to gain more insight on the state of the cycle, and Nick's response corroborated our findings: slowing demand in personal electronics is evident, but penetration into auto and industrial markets is still contributing to estimates growth. Despite this positive commentary, however, some investors actually want auto-facing players to cite slowing demand, as this would indicate the bottom. Still, NeedhamBank does not anticipate this commentary through FY'22, and even believes the automotive market can avoid a sharp inflection point altogether, and experience a "soft-landing" in FY'23 at worst.



From a broader perspective, Nick mentioned that the industry's cyclical nature is fundamentally different today versus a decade ago. This is because previous mega drivers, like PCs, smartphones, and data centers, all coexist. On top of that, adding in automotive and IoT applications help to smooth the curve even further.

- **Inventory:** A recent business transformation for NXPI is its usage of NCNR orders, which Nick highlighted to be one of the Company's biggest strengths. Around four years ago, these were non-existent, but now, they make up ~50% of NXPI's backlog. While this strategy is not foolproof considering customers can break contracts, they would still incur fees and fray the relationship, which deters that action. Moreover, in regard to key metrics, NeedhamBank is looking for the 52-week lead times to come down, as that would indicate easing supply constraints. They also expect channel inventories to remain at 1.6 months in 3Q, given high demand.

Another phenomenon that is permanently changing business models is the shift from "just-in-time" orders to "just-in-case". Before the pandemic, customers used to order chips for immediate use, which is no longer sustainable; they are now ordering far in advance and in double, which should better the terms for chipmakers.

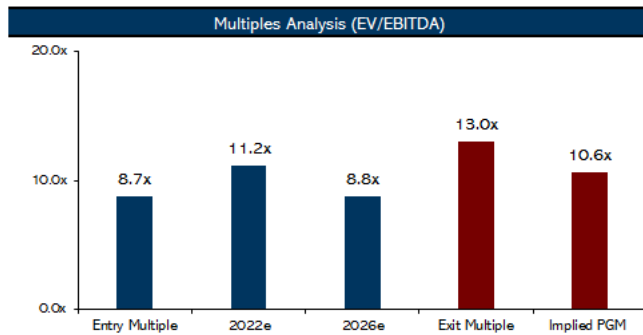


## Exhibit II: Model Output

### NXP Semiconductors N.V. (NXPI) Valuation Overview

\$ in Millions Except Per Share Data

Price Target Scenario: Base Case  
Current Share Price: \$153.51  
Valuation Date: 9/28/2022



**Return Summary**

Exit Multiple Method	
Implied Enterprise Value:	\$66,206
Implied Equity Value:	58,327
Implied Share Price:	\$220
% Return:	43.5%
Perpetuity Growth Method	
Implied Enterprise Value:	\$56,209
Implied Equity Value:	48,330
Implied Share Price:	\$183
% Return:	18.9%

Consolidated Financials	Annuals							CAGR	CAGR
	2020	2021	2022e	2023e	2024e	2025e	2026e	Historical	Projected
Revenue	\$8,612	\$11,063	\$13,377	\$14,265	\$14,784	\$15,469	\$16,283	11.6%	8.0%
YoY % Growth	(3.0%)	28.5%	20.9%	6.6%	3.6%	4.6%	5.3%		
Gross Profit	\$4,235	\$6,067	\$7,588	\$8,023	\$8,279	\$8,740	\$9,282	14.6%	8.9%
% Margin	49.2%	54.8%	56.7%	56.2%	56.0%	56.5%	57.0%		
YoY % Growth	(8.3%)	43.3%	25.1%	5.7%	3.2%	5.6%	6.2%		
EBITDA	\$1,717	\$3,330	\$4,450	\$4,777	\$5,049	\$5,328	\$5,657	100.7%	11.5%
Margin	19.9%	30.1%	33.3%	33.5%	34.2%	34.4%	34.7%		
YoY % Growth	(34.8%)	517.9%	42.4%	0.6%	8.3%	4.9%	6.1%		
Net Income (Loss)	\$80	\$2,096	\$2,902	\$2,976	\$3,225	\$3,383	\$3,590	177.6%	11.4%
Margin	0.9%	18.9%	21.7%	20.9%	21.8%	21.9%	22.0%		
YoY % Growth	(70.6%)	2,520.0%	38.5%	2.6%	8.4%	4.9%	6.1%		
Adj. EPS (Diluted)	\$0	\$7	\$11	\$12	\$13	\$14	\$15	196.6%	15.1%
YoY % Growth	(78.4%)	3,980.8%	46.4%	6.9%	11.2%	7.2%	8.4%		
Free Cash Flow	\$1,126	\$1,865	\$2,223	\$2,456	\$2,636	\$2,901	\$3,120	46.4%	8.8%
YoY % Growth	29.4%	65.6%	19.2%	10.5%	7.3%	10.1%	7.5%		

Capitalization and Key Ratios	Annuals							Average	Average
	2020	2021	2022e	2023e	2024e	2025e	2026e	Historical	Projected
<b>Leverage</b>									
Total Debt / EBITDA	4.4x	3.2x	2.3x	2.0x	1.8x	1.6x	1.4x	3.7x	1.8x
Total Debt / Equity	0.8x	1.6x	1.3x	1.0x	0.8x	0.7x	0.6x	1.1x	0.9x
Total Debt / Total Assets	0.4x	0.5x	0.5x	0.4x	0.4x	0.3x	0.3x	0.4x	0.4x
<b>Liquidity</b>									
Current Ratio	2.1x	2.1x	1.9x	1.9x	2.2x	2.4x	2.5x	2.0x	2.2x
Quick Ratio	1.5x	1.5x	1.3x	1.2x	1.5x	1.6x	1.8x	1.3x	1.5x
Cash Ratio	1.1x	1.2x	0.9x	0.8x	1.0x	1.2x	1.3x	1.0x	1.1x
<b>Profitability</b>									
Return on Assets (ROA)	0.4%	10.0%	13.2%	13.3%	13.6%	13.6%	13.7%	3.9%	13.5%
Return on Equity (ROE)	0.9%	31.0%	38.0%	33.3%	30.1%	27.3%	25.8%	11.6%	30.9%
Return on Inv. Capital (ROIC)	0.5%	12.1%	16.3%	16.3%	16.5%	16.3%	16.5%	4.7%	16.4%
<b>Coverage</b>									
Interest Expense	\$349	\$365	\$388	\$341	\$318	\$300	\$283	\$342	\$326
Capital Expenditures	392	767	964	999	1,183	1,237	1,303	562	1,137
EBIT / Interest	1.2x	7.1x	9.5x	10.9x	12.6x	14.0x	15.8x	3.4x	12.5x
EBITDA / Interest	4.9x	9.1x	11.5x	14.0x	15.9x	17.7x	20.0x	6.9x	15.8x
(EBITDA - CapEx) / Interest	3.8x	7.0x	9.0x	11.1x	12.2x	13.6x	15.4x	5.2x	12.2x
<b>Efficiency</b>									
Asset Turnover	0.4x	0.5x	0.6x	0.6x	0.6x	0.6x	0.6x	0.5x	0.6x
Days Sales Outstanding	30.3	27.8	27.6	29.3	30.0	30.0	30.0	29.8	29.4
Days Inventory Outstanding	92.6	81.1	84.3	91.8	95.0	95.0	95.0	91.6	92.2
Days Payables Outstanding	80.7	81.9	83.7	81.8	75.0	75.0	75.0	78.5	78.1
Cash Conversion Cycle	42.3	27.0	28.2	39.3	50.0	50.0	50.0	43.0	43.5



Exhibit III: DCF Implied Valuation

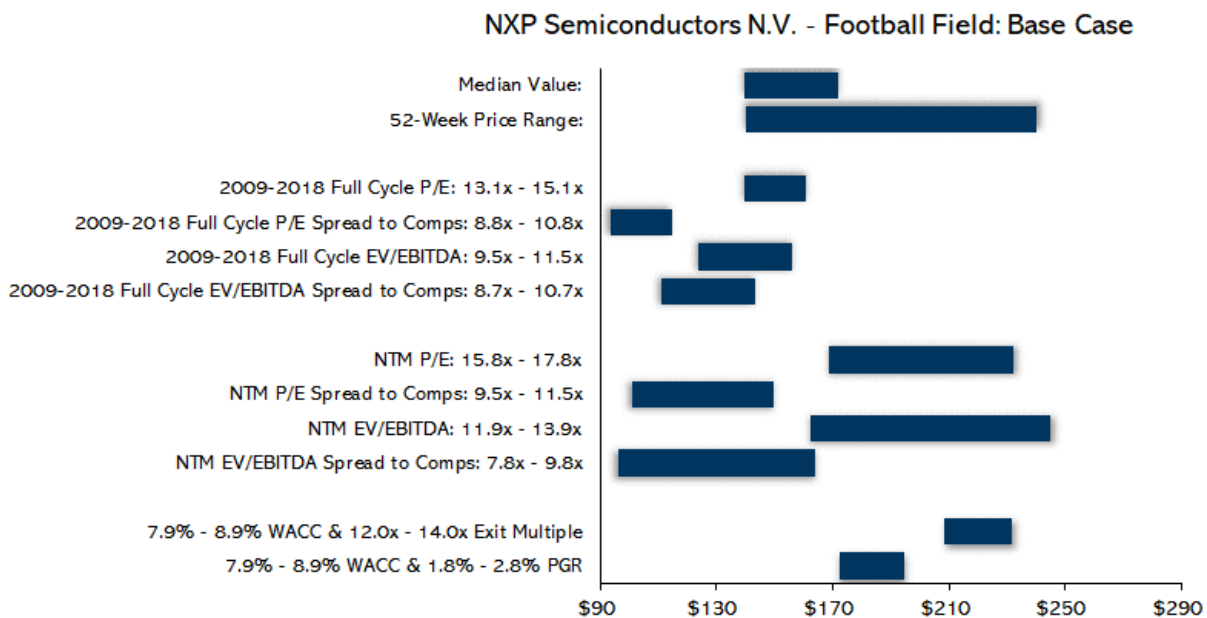
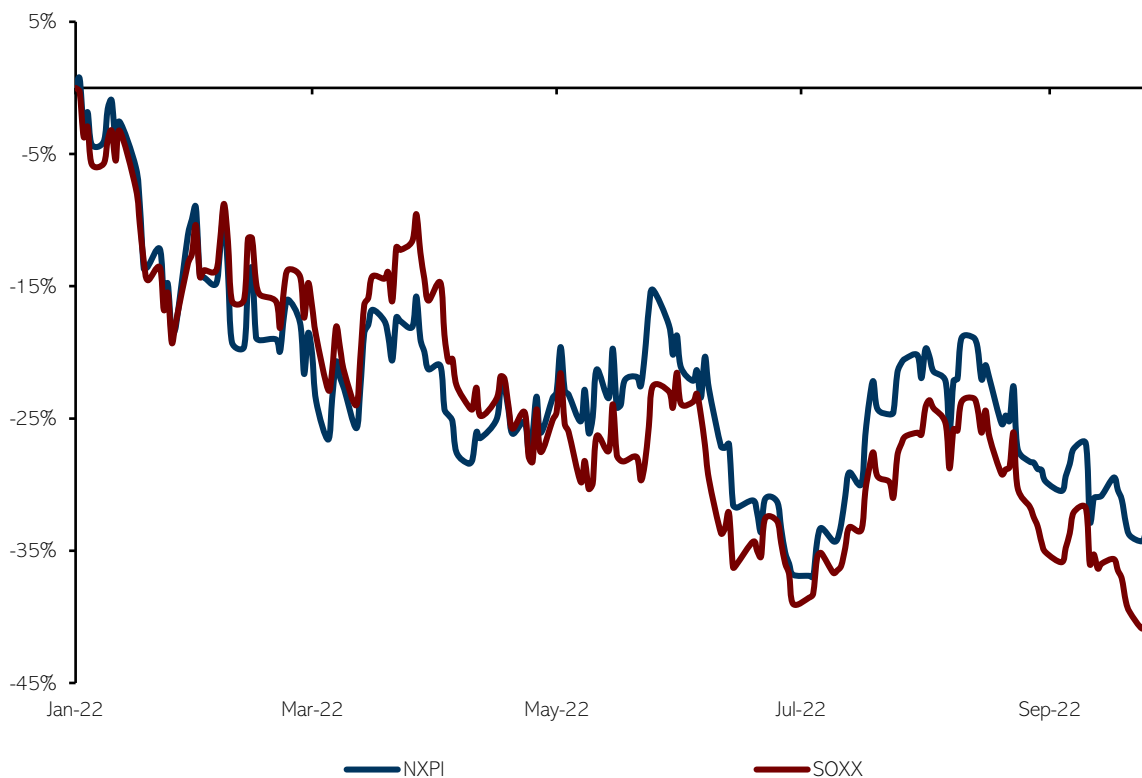


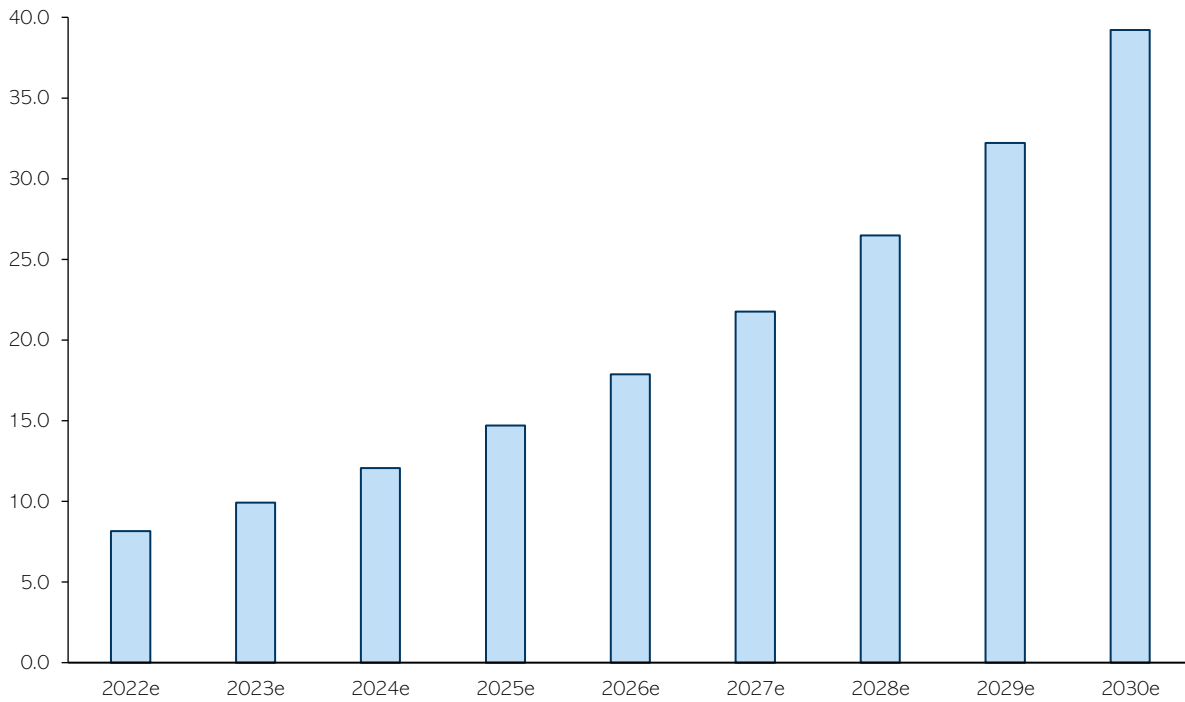
Exhibit IV: Relative YTD Performance of NXPI vs. SOXX



Source: Bloomberg

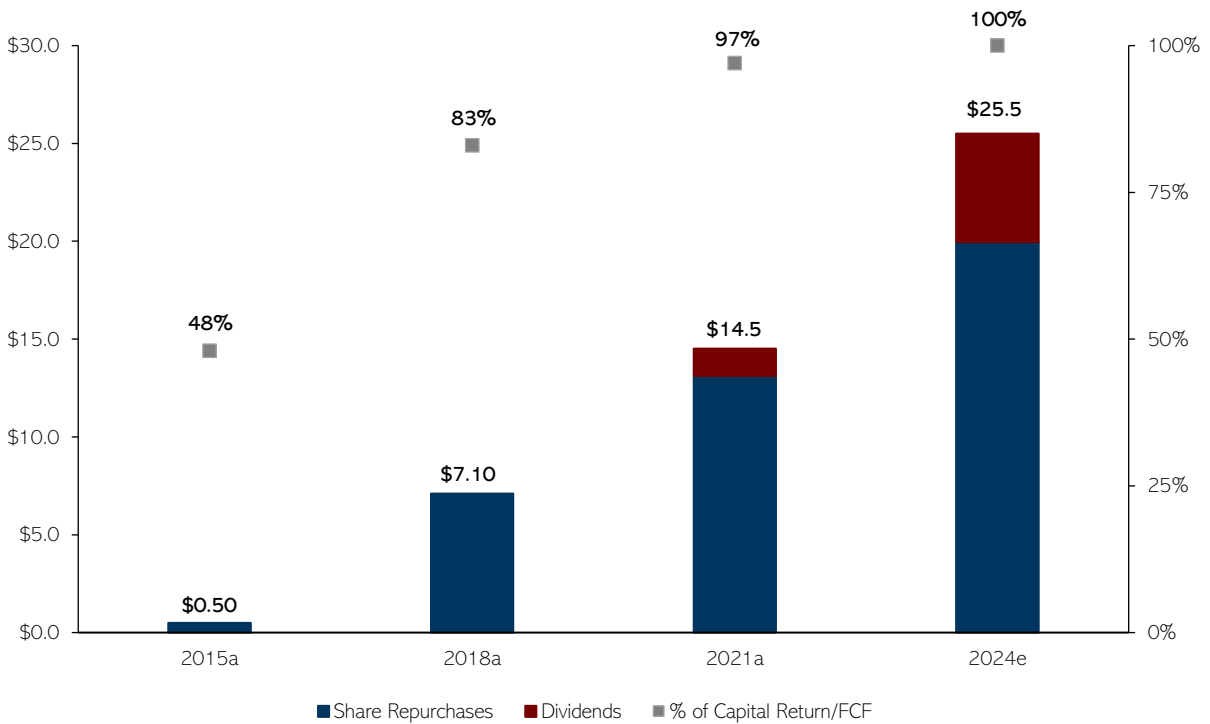


**Exhibit V: Global EV Sales (mn)**



Source: Statista

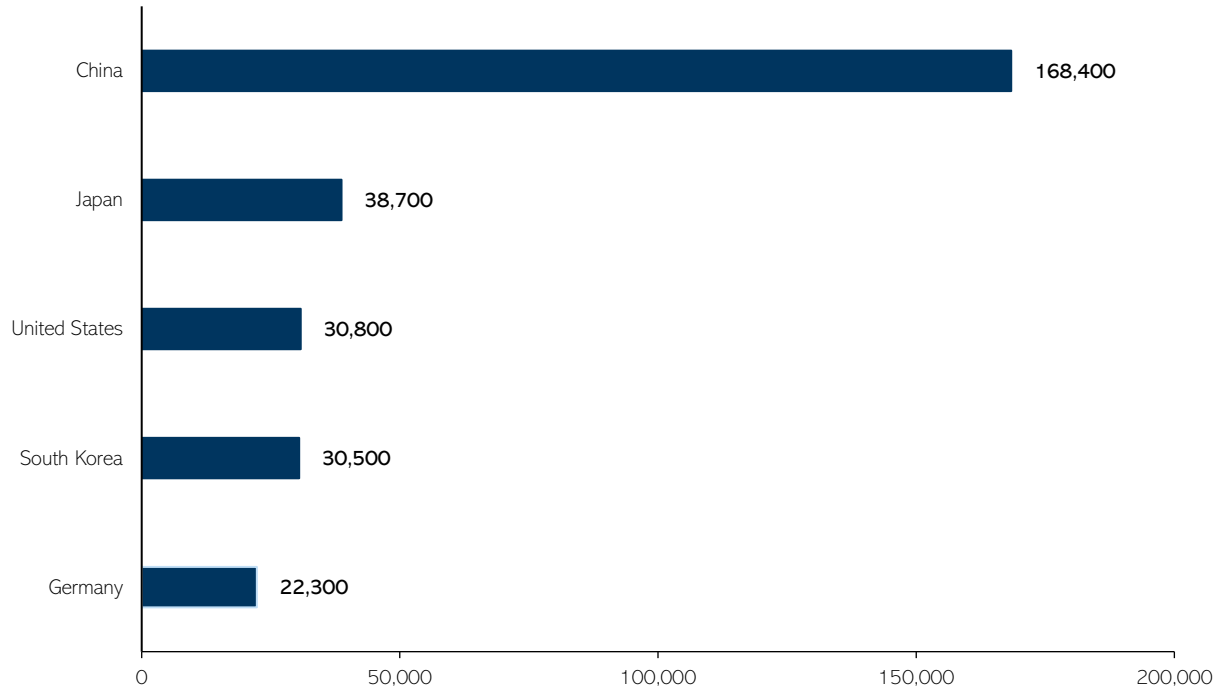
**Exhibit VI: NXPI Capital Allocation (bn)**



Source: Company Filings

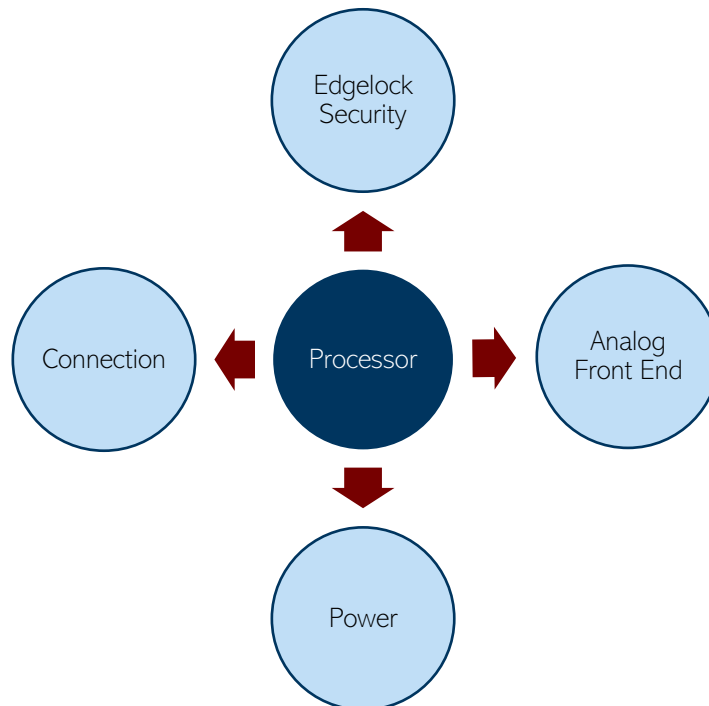


### Exhibit VII: Annual Installations of Industrial Robots



Source: IFA

### Exhibit VIII: Processor Connectivity in Factory Automation



Source: Company Filings





## TFA STATEMENT

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