



Taiwan Semiconductors  
Active GEM Fund Ownership Report  
11/30/2022

# Taiwan Semiconductors Active GEM Fund Ownership Report 11/30/2022

## Introduction

In this data report, we analyse Taiwan Semiconductors holdings among active GEM Equity Funds. We analyse the latest published filings for all funds and aggregate together as of 11/30/2022. We show the most recent snapshot in positioning, time series data going back to 1/31/2008 and recent allocation shifts by the managers in our analysis. The current fund sample spans 267 active funds with a combined AUM of \$336.81Bn.

For benchmark comparisons, we use the iShares MSCI Emerging Markets ETF, proportionally adjusted to remove any cash holdings. All Cash Flow calculations are on a best estimates basis. We use monthly position changes and month end prices to estimate the net buying and selling value for each stock within each fund in our analysis.

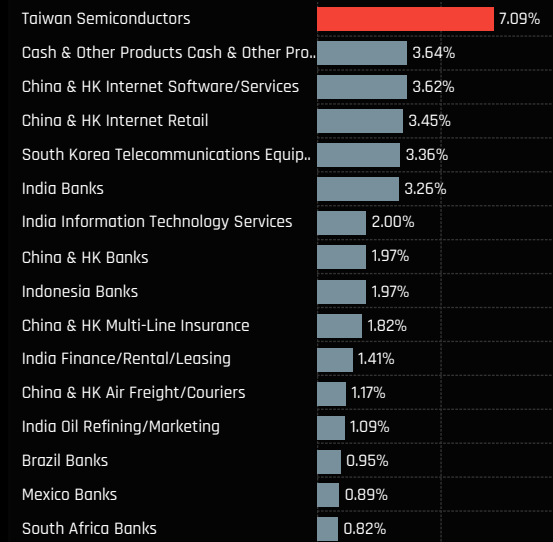
For further information on the calculation methodology that we use in the analysis and the classification of fund Styles, please view the Glossary on page 22.

# Taiwan Semiconductors

# Peer Group and Time-Series Ownership Data

Chart 1. The equally weighted average fund weight, among active GEM managers by Country Industry  
 Chart 2. The time series of average fund weight for Taiwan Semiconductors stocks

### Ch 1. Country Industry: Average Fund Weights



### Ch 2. Taiwan Semiconductors: Average Fund Weight Time-Series

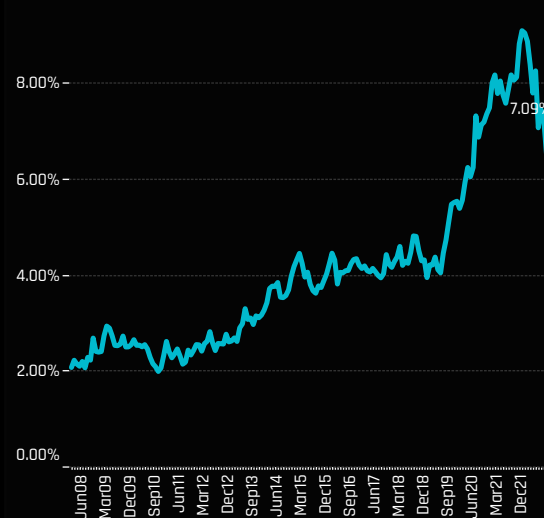


Chart 3. The average fund weight minus the weight in the iShares MSCI Emerging Markets ETF, by Country Industry. A positive value represents an 'overweight' position on average, a negative value represents an 'underweight'.

Chart 4. The time series of average fund weight minus benchmark for Taiwan Semiconductors stocks

### Ch 3. Country Industry: Average Fund Weights vs EEM



### Ch 4. Taiwan Semiconductors: Average Weight vs EEM Time-Series

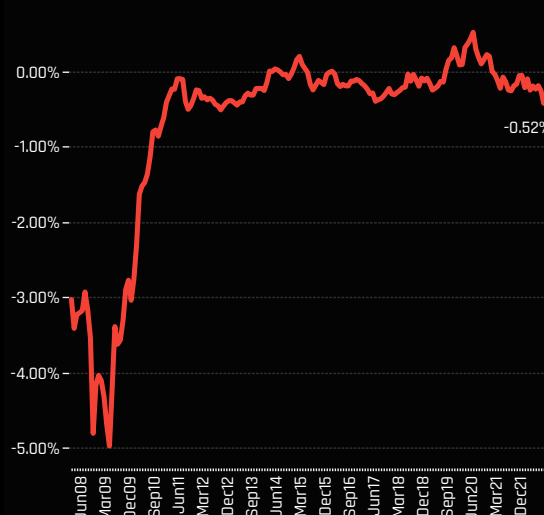
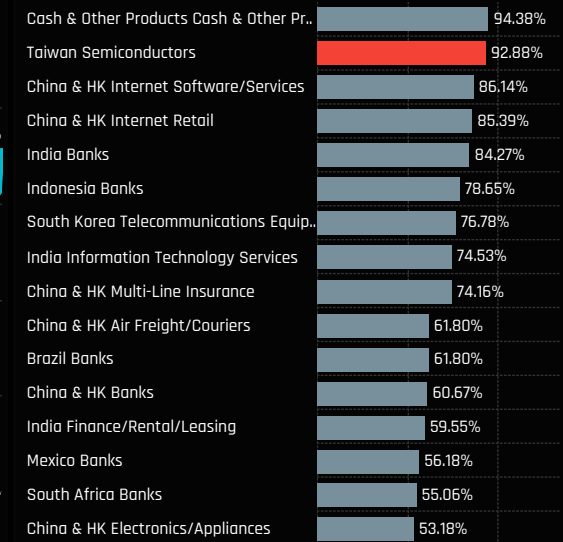


Chart 5. The 'Funds Invested %' measures the percentage of active GEM funds with exposure to each Country Industry. A figure of 100% means that every fund in our analysis has some exposure to that Country Industry

Chart 6. The time series of funds invested % for Taiwan Semiconductors stocks

### Ch 5. Country Industry: Funds Invested %



### Ch 6. Taiwan Semiconductors: Funds Invested % Time-Series

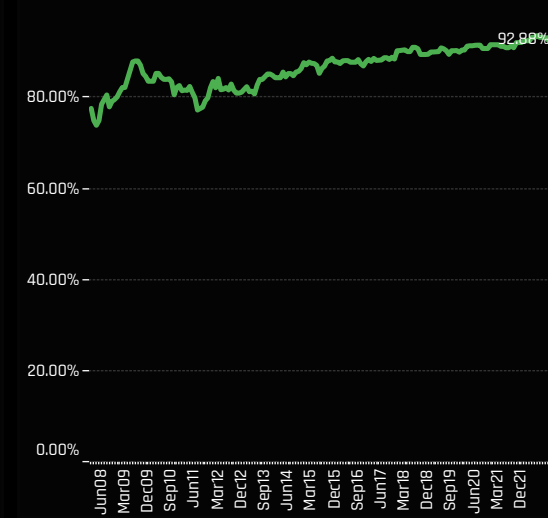
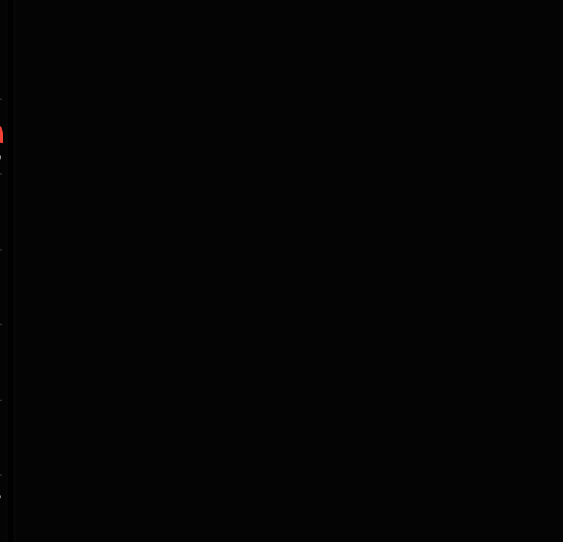


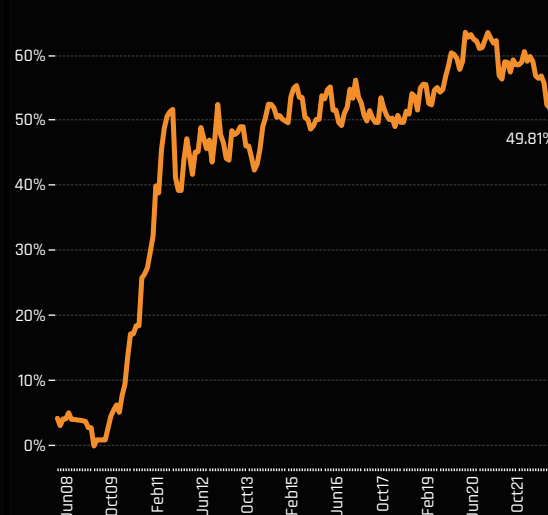
Chart 7. The percentage of active GEM funds who are overweight the iShares MSCI Emerging Markets ETF weight, by Country Industry

Chart 8. The time series of Funds Overweight % for Taiwan Semiconductors stocks

### Ch 7. Country Industry: Funds Overweight %



### Ch 8. Taiwan Semiconductors: Funds Overweight % Time-Series



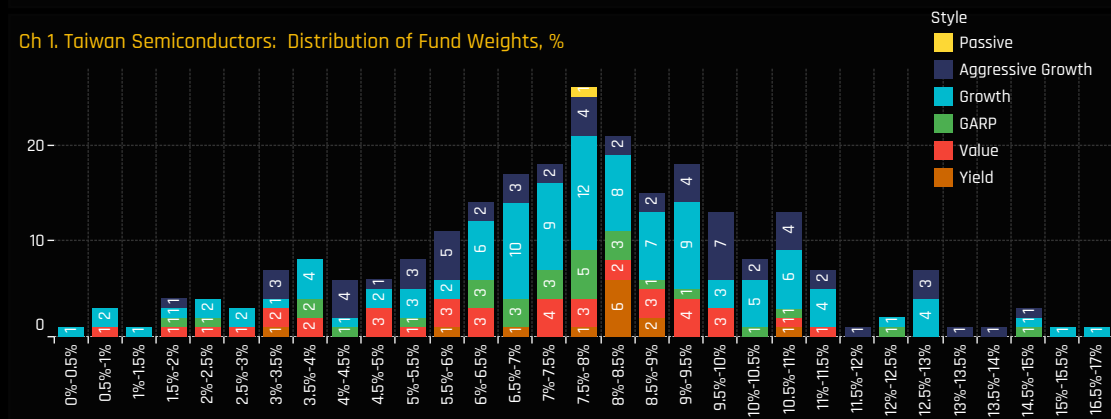
# Taiwan Semiconductors

# Fund Holdings

Chart 1. The distribution of Taiwan Semiconductors weights among the 267 active GEM funds in our analysis, broken down by fund Style.

Chart 2. The largest 30 Taiwan Semiconductors holders in our analysis, on a portfolio weight basis.

Ch 1. Taiwan Semiconductors: Distribution of Fund Weights, %



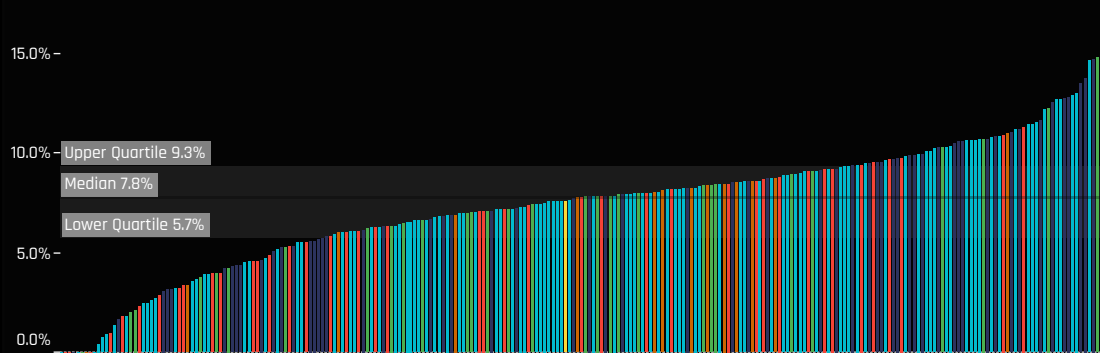
Ch 2. Taiwan Semiconductors: Top Fund Holdings, %

Fund Name	Style	Weight (%)
Fisher Invt. Instl. Fds. Plc - Emerging Markets Eq. ESG Fund	Growth	16.72%
Templeton Developing Markets Trust	Growth	15.34%
Delaware Emerging Markets Fund	GARP	14.73%
Polar Capital Funds Plc - Emerging Market Stars Fund	Aggressive Growth	14.72%
Fisher Invt. Instl. Fds. Plc - Emerging Markets Equity Fund	Growth	14.62%
Mobius SICAV - Emerging Markets Fund	Aggressive Growth	13.71%
Nordea 1 - Emerging Stars Equity Fund	Aggressive Growth	13.48%
UBS Investment Funds ICVC - Global Emerging Markets Equity	Growth	12.99%
Fidelity Institutional Funds - Emerging Markets Fund	Growth	12.86%
Jupiter Asset Mgmt. Series Plc - Global EM Focus Fd.	Aggressive Growth	12.79%
JPMorgan Funds - Emerging Markets Sustainable Equity Fund	Aggressive Growth	12.75%
Vontobel Fund - mtx Sustainable Emerging Markets Leaders	Growth	12.64%
Artisan Sustainable Emerging Markets Fund	Growth	12.62%
Jupiter Global Emerging Markets Fund	Aggressive Growth	12.51%
TIAA-CREF Emerging Markets Equity Fund	GARP	12.22%
Goldman Sachs ESG Emerging Markets Equity Fund	Growth	12.17%
AB FCP I - Emerging Markets Growth Portfolio	Aggressive Growth	11.62%
John Hancock Emerging Markets Equity Fund	Growth	11.49%
Baillie Gifford Overseas Growth Funds ICVC - EM. Growth	Growth	11.44%
Raiffeisen Sustainable Emerging Markets Equities	Growth	11.43%
BNY Mellon Emerging Markets Securities Fund	Value	11.32%
Fidelity Inv. Trust - Emerging Markets Fund	Aggressive Growth	11.16%
TT International Funds Plc - Emerging Markets Unconstrained	Growth	11.14%
JPMorgan Emerging Markets Equity Fund	Aggressive Growth	11.02%
JPMorgan Fund ICVC - Emerging Markets Income Fund	Yield	10.93%
Nordea Emerging Market Equities	Value	10.90%
GS Funds - Emerging Markets Equity Portfolio	Growth	10.85%
CT (Lux) III - Responsible Global Emerging Markets Equity	Aggressive Growth	10.84%
Goldman Sachs Emerging Markets Equity Fund	Growth	10.72%
Ashmore SICAV - Emerging Markets Equity ESG Fund	Aggressive Growth	10.71%

Chart 3. The individual Taiwan Semiconductors fund weights funds in our analysis, ranked by allocation size with Median and Quartiles.

Chart 4. The largest 30 Taiwan Semiconductors holders in our analysis, on an \$ AUM basis.

Ch 3. Taiwan Semiconductors: Fund Weights, %



Ch 4. Taiwan Semiconductors: Top Fund Holdings, \$

Fund Name	Style	AUM (\$)
Invesco Developing Markets Fund	Growth	\$2,756.22M
Fidelity Inv. Trust - Emerging Markets Opportunities Fund	Growth	\$2,069.84M
iShares MSCI Emerging Markets ETF	Passive	\$1,787.37M
American Funds New World Fund	Growth	\$1,143.17M
JPMorgan Emerging Markets Equity Fund	Aggressive Growth	\$918.91M
T Rowe Price Emerging Markets Stock Fund	Aggressive Growth	\$748.71M
Delaware Emerging Markets Fund	GARP	\$730.85M
Fidelity Inv. Trust - Emerging Markets Fund	Aggressive Growth	\$728.12M
Vontobel Fund - mtx Sustainable Emerging Markets Leaders	Growth	\$580.87M
GQG Partners Emerging Markets Equity Fund	Growth	\$558.68M
MFS Emerging Markets Equity Fund	Growth	\$497.72M
Schroder ISF - Emerging Markets	Growth	\$409.32M
Federated Hermes Invt. Funds - Global Emerging Markets Equity	Aggressive Growth	\$406.20M
Nordea 1 - Emerging Stars Equity Fund	Aggressive Growth	\$404.49M
Fidelity Institutional Funds - Emerging Markets Fund	Growth	\$381.84M
Allspring Emerging Markets Equity Fund	Growth	\$360.35M
Goldman Sachs Emerging Markets Equity Fund	Growth	\$358.65M
GS Funds - Emerging Markets Equity Portfolio	Growth	\$354.83M
Baron Emerging Markets Fund	Growth	\$321.47M
JPMorgan Funds - Emerging Markets Opportunities Fund	Growth	\$282.93M
BlackRock Emerging Markets Fund Inc.	Growth	\$261.63M
Calvert Emerging Markets Equity Fund	Aggressive Growth	\$259.62M
abrdn Emerging Markets Fund	Growth	\$247.08M
Candriam Sustainable - Equity Emerging Market	Aggressive Growth	\$233.20M
JPMorgan Trust IV - Emerging Markets Research Enhanced Equity	Growth	\$232.02M
John Hancock Emerging Markets Equity Fund	Growth	\$221.41M
American Century Emerging Markets Fund	Growth	\$220.84M
Harding Loevner Institutional Emerging Markets Portfolio	Aggressive Growth	\$206.37M
TIAA-CREF Emerging Markets Equity Fund	GARP	\$204.41M
Principal Origin Emerging Markets Fund	GARP	\$204.35M

# Taiwan Semiconductors

# Aggregate Ownership Changes

Chart 1. Measures the largest changes in average Country Industry weight between 11/30/2021 and 11/30/2022.

**Ch 1. Country Industry: Change in Average Weight 11/30/2021 - 11/30/2022**

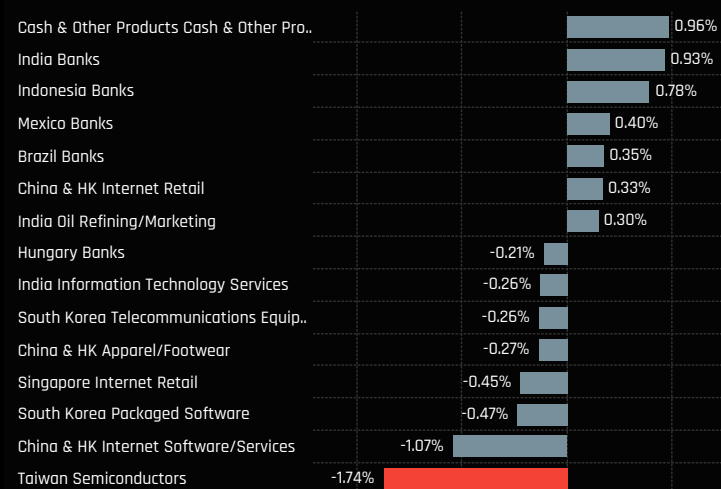


Chart 2. Measures the largest changes in the average Country Industry weight vs EEM between 11/30/2021 and 11/30/2022. An increasing figure would indicate an increasing overweight or decreasing underweight.

**Ch 2. Country Industry: Change in Average Fund Weight vs EEM**

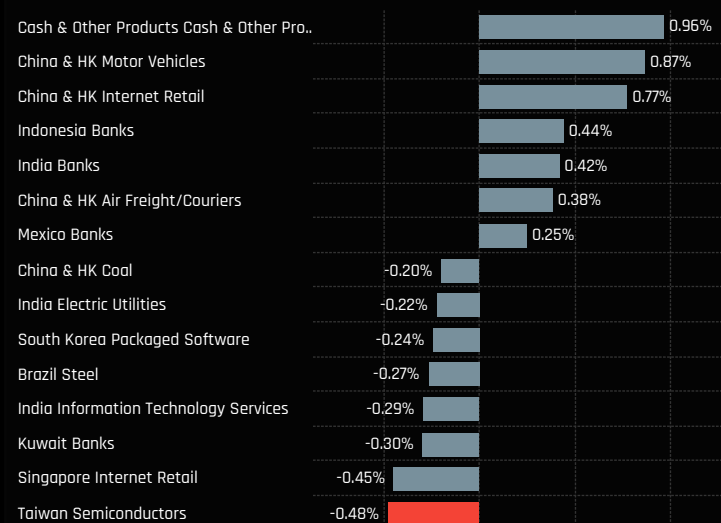


Chart 3. Measures the largest changes in the percentage of funds invested in each Country Industry between 11/30/2021 and 11/30/2022.

**Ch 3. Country Industry: Change in Funds Invested % 11/30/2021 - 11/30/2022**

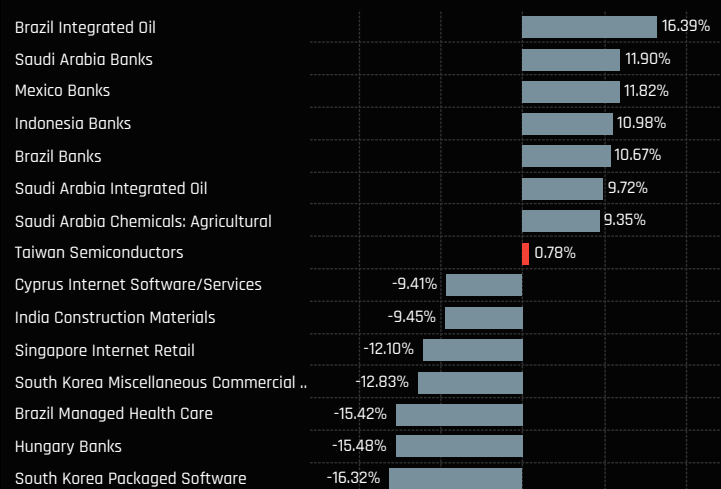


Chart 4. Measures the largest changes in the percentage of funds overweight each Country Industry compared to the iShares MSCI Emerging Markets ETF between 11/30/2021 and 11/30/2022. An increasing figure would indicate more funds are positioning themselves overweight over the period.

**Ch 4. Country Industry: Change in the Funds Overweight % 11/30/2021 - 11/30/2022**

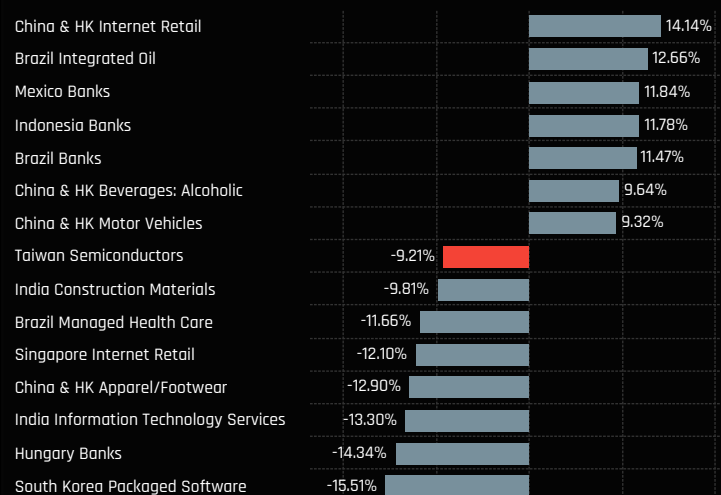


Chart 5. Shows the cumulative fund flows for Taiwan Semiconductors stocks among the 267 active GEM funds in our analysis. Monthly fund flows are estimated by multiplying the monthly change in stock position by the stock price for every position in every fund in our analysis.

**Ch 5. Taiwan Semiconductors: Cumulative Fund Flows, \$**

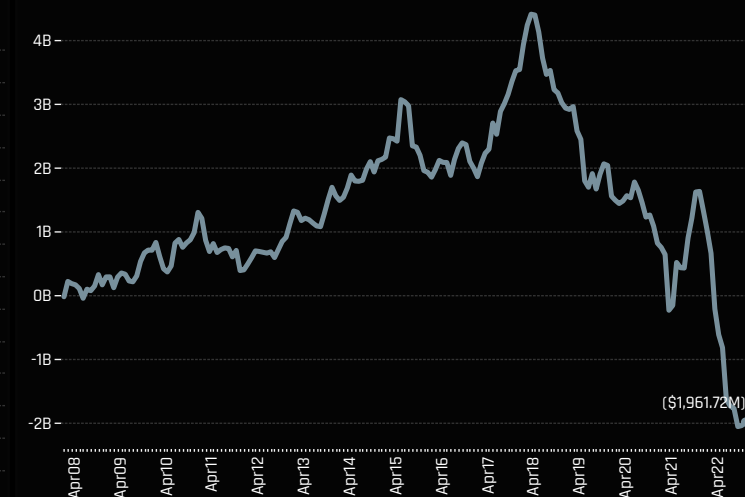
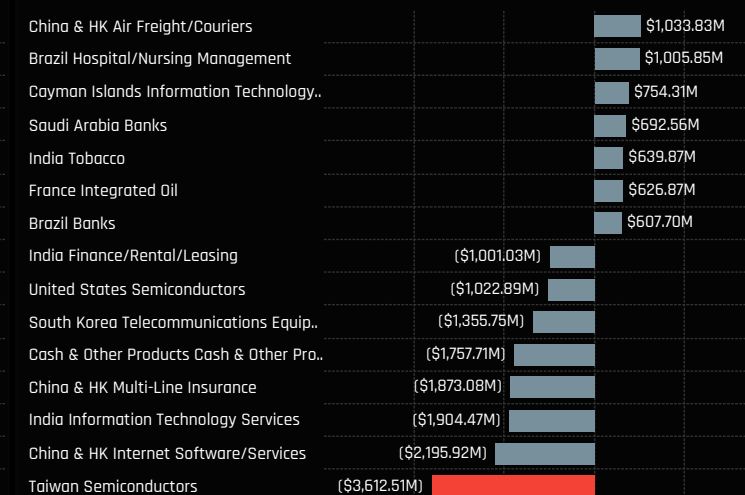


Chart 6. Measures the largest estimated fund flows for each Country Industry between 11/30/2021 and 11/30/2022.

**Ch 6. Country Industry: Largest Fund Flows per Country Industry 11/30/2021 - 11/30/2022**



# Taiwan Semiconductors

# Fund Holding Changes

Chart 1. The largest fund weight increases in Taiwan Semiconductors stocks between 11/30/2021 - 11/30/2022.  
 Chart 2. The largest fund weight decreases in Taiwan Semiconductors stocks between 11/30/2021 - 11/30/2022  
 Both charts show the current weight and whether the weight change represented a new or closed position.

## Ch 1. Taiwan Semiconductors: Largest Increases in Position, %

Fund Name	New or Close..	Latest Weight	Weight Change
First Sentier Investors ICVC - Stewart Inv. Glb. EM Leaders	New	6.24%	6.24%
AMG GW&K Emerging Wealth Equity Fund		4.62%	4.06%
Carmignac Emergents	New	3.96%	3.96%
First State Investments ICVC - Global Emerging Markets Fd.	New	3.91%	3.91%
Sunbridge Capital Emerging Markets Fund	New	3.70%	3.70%
White Fleet - OLZ Equity Emerging Market Optimized ESG	New	2.72%	2.72%
M&G Investment Funds (7) OEIC - Global Emerging Markets Fund		5.32%	2.49%
CIF - Emerging Markets Growth Fund (LUX)		6.52%	2.15%
JPMorgan Emerging Markets Equity Fund		11.02%	2.13%
Virtus NFJ Emerging Markets Value Fund		9.69%	2.03%
Jupiter Global Emerging Markets Fund		12.51%	1.69%
UNI-GLOBAL - Equities Emerging Markets		6.38%	1.52%
Robeco Capital Gr. Fds. - Emerging Stars Equities		9.42%	1.48%
Lazard Emerging Markets Equity Portfolio		6.08%	1.44%
Voya Investors Trust - JPMorgan Emerging Markets Equity Port.		10.24%	1.30%
Essor Emerging Markets		9.45%	1.30%
Pictet - Emerging Markets Sustainable Equities		10.61%	1.21%
Baron Emerging Markets Fund		6.03%	0.96%
TT International Funds Plc - Emerging Markets Unconstrained		11.14%	0.93%
Artemis Investment Funds ICVC - Global Emerging Markets		4.56%	0.92%

## Ch 2. Taiwan Semiconductors: Largest Decreases in Position, %

Fund Name	New or Close..	Latest Weight	Weight Change
PGLM Jennison Emerging Markets Equity Opportunities Fund	Close	0.00%	-11.50%
Amana Developing World Fund		2.45%	-10.26%
Amonis Equity Emerging Markets		3.12%	-10.07%
Liontrust Investment Funds II - Emerging Markets Fund		3.56%	-10.02%
William Blair Emerging Markets Growth Fund		8.47%	-9.79%
Putnam Emerging Markets Equity Fund		9.69%	-7.33%
Wellington Mgmt. Funds (IE) Plc - EM Opportunities Fund		6.61%	-7.31%
Virtus Vontobel Emerging Markets Opportunities Fund		5.59%	-6.55%
Candriam Sustainable - Equity Emerging Market		8.68%	-6.22%
Goldman Sachs Emerging Markets Equity Insights Fund		6.34%	-5.98%
Schroder ISF - QEP Global Emerging Markets		4.23%	-5.93%
Pear Tree Axiom Emerging Markets World Equity Fund		6.32%	-5.81%
TCW Developing Markets Equity Fund		7.15%	-5.76%
Allianz Global Investors Fund - Best Styles EM Equity SRI		5.98%	-5.27%
Principal Origin Emerging Markets Fund		9.06%	-5.06%
Cullen Emerging Markets High Dividend Fund		3.35%	-5.04%
William Blair Emerging Markets Leaders Fund		7.86%	-4.98%
Pictet - Emerging Markets		10.59%	-4.94%
Wellington Mgmt. Funds (IE) Plc - Emerging Mkts. Local Eq.		1.78%	-4.87%
Principal Investors - International Emerging Markets Fund		7.96%	-4.81%

Chart 3. The largest buyers in US dollar terms in Taiwan Semiconductors stocks between 11/30/2021 - 11/30/2022.  
 Chart 4. The largest sellers in US dollar terms in Taiwan Semiconductors stocks between 11/30/2021 - 11/30/2022  
 Both charts show the current AUM and whether the fund flow represented a new or closed position.

## Ch 3. Taiwan Semiconductors: Largest Fund Inflows, \$

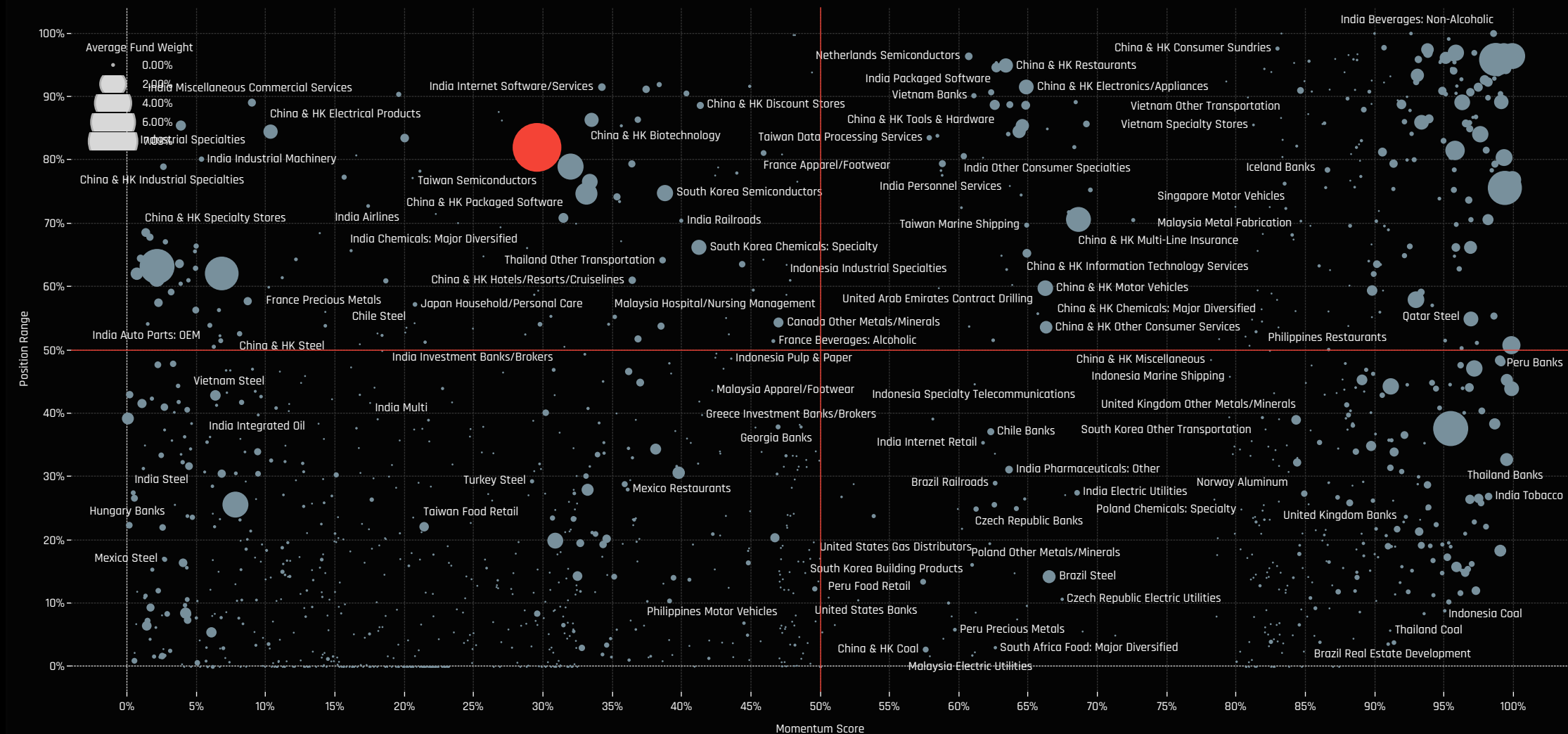
Fund Name	New or Close..	Latest AUM, \$	Fund Flows, \$
JPMorgan Emerging Markets Equity Fund		\$918.91M	\$262.12M
Fidelity Inv. Trust - Emerging Markets Opportunities Fund		\$2,069.84M	\$184.05M
Fidelity SAI Emerging Markets Value Index Fund		\$168.06M	\$106.16M
GQG Partners Emerging Markets Equity Fund		\$558.68M	\$86.51M
Lazard Emerging Markets Equity Portfolio		\$174.66M	\$73.62M
TIAA-CREF Emerging Markets Equity Fund		\$204.41M	\$59.31M
iShares MSCI Emerging Markets ETF		\$1,787.37M	\$57.20M
First Sentier Investors ICVC - Stewart Inv. Glb. EM Leaders	New	\$40.28M	\$56.15M
T Rowe Price Emerging Markets Discovery Stock Fund		\$86.76M	\$54.66M
Carmignac Emergents	New	\$34.48M	\$46.66M
Polar Capital Funds Plc - Emerging Market Stars Fund		\$156.00M	\$44.63M
UBS Investment Funds ICVC - Global Emerging Markets Equity		\$141.34M	\$43.43M
Robeco Capital Gr. Fds. - Emerging Stars Equities		\$150.18M	\$41.86M
Fidelity Inv. Trust - Emerging Markets Fund		\$728.12M	\$41.03M
Wasatch Emerging Markets Select Fund		\$29.12M	\$36.50M
Fidelity Funds SICAV - Sust. Emerging Markets Equity Fund		\$120.16M	\$31.10M
Federated Hermes Inv. Funds - Global Emerging Markets Equity		\$406.20M	\$28.07M
Raiffeisen Sustainable Emerging Markets Equities		\$31.54M	\$27.01M
Empower Emerging Markets Equity Fund		\$65.04M	\$24.42M
JPMorgan Funds - Emerging Markets Sustainable Equity Fund		\$98.58M	\$21.74M

## Ch 4. Taiwan Semiconductors: Largest Fund Outflows, \$

Fund Name	New or Close..	Latest AUM, \$	Fund Flows, \$
Invesco Developing Markets Fund		\$2,756.22M	(\$610.42M)
T Rowe Price Emerging Markets Stock Fund		\$748.71M	(\$361.39M)
Virtus Vontobel Emerging Markets Opportunities Fund		\$112.84M	(\$358.27M)
American Funds New World Fund		\$1,143.17M	(\$278.11M)
JPMorgan Funds - Emerging Markets Opportunities Fund		\$282.93M	(\$138.99M)
Vontobel Fund - Emerging Markets Equity		\$82.00M	(\$132.30M)
Schroder ISF - Emerging Markets		\$409.32M	(\$125.33M)
Causeway Emerging Markets Fund		\$130.30M	(\$124.99M)
Nordea 1 - Emerging Stars Equity Fund		\$404.49M	(\$112.20M)
Principal Origin Emerging Markets Fund		\$204.35M	(\$111.07M)
Touchstone Strategic Trust - Sands Capital E.M. Growth Fund		\$128.75M	(\$108.49M)
Harding Loevner Institutional Emerging Markets Portfolio		\$206.37M	(\$96.98M)
Delaware Ivy Emerging Markets Equity Fund		\$107.81M	(\$95.98M)
William Blair Emerging Markets Growth Fund		\$57.88M	(\$89.14M)
Vontobel Fund - mtx Sustainable Emerging Markets Leaders		\$580.87M	(\$88.26M)
abrdn Emerging Markets Fund		\$247.08M	(\$88.22M)
Allspring Emerging Markets Equity Fund		\$360.35M	(\$85.48M)
Comgest Growth Plc - Emerging Markets		\$57.41M	(\$85.43M)
Fisher Invt. Instl. Fds. Plc - Emerging Markets Equity Fund		\$106.29M	(\$85.27M)
Candriam Equities L - Emerging Markets		\$115.26M	(\$84.85M)

calculate the Z-Score of today's average weight, funds invested % and funds o/w % relative to all monthly observations in our fund history (going back to 1/31/2008). A figure close to 100% would indicate today's positioning is close to its maximum ever level, a figure close to zero, the lowest. The X-axis provides a measure of short-term fund activity, or 'Momentum', by looking at the changes in average weight, funds invested % and funds o/w % between 11/30/2021 and 11/30/2022, relative to each Country Industry. A figure above 50% means a Country Industry has seen relative increases in ownership, a figure below 50% indicates a relative decrease in positioning. The size of the bubble represents the average weight of each Country Industry.

Country Industry Sentiment Grid. GEM Active Funds  
Momentum Measure between 11/30/2021 - 11/30/2022



Position Range: Average of:  
Z-Score Average Weight vs history  
Z-Score Funds Invested % vs history  
Z-Score Funds O/W % vs history

Momentum Score: Average of:  
Change in Average Weight (Percentile vs Peers)  
Change in Funds Invested % (Percentile vs Peers)  
Change in Funds O/W % (Percentile vs Peers)

Chart 1. The largest 10 stock holdings in Taiwan Semiconductors, by Average Weight. The chart also shows the average weight as a percentage of the total Taiwan Semiconductors weight, and the cumulative total.  
 Chart 2. Shows aggregate stock holdings data for Taiwan Semiconductors stocks, ranked by Funds Invested % (most widely held).

Chart 3. Top 5 overweight and underweight Taiwan Semiconductors stock positions / as a percentage of the total Taiwan Semiconductors weight relative to benchmark.  
 Charts 4&5. The largest overweight and underweight stock holdings, plus associated aggregate holdings data.

### Ch 1. Taiwan Semiconductors. Top 10 Stock Weights, Percentage of Taiwan Semiconductors Total, Cumulative Percentage Total.

Ticker	Stock Name	Average Weight	Percentage of Total	Cumulative Percentage Total
2330-TW	Taiwan Semiconductor Manufacturing Co., L.	5.48%	77.32%	77.32%
2454-TW	MediaTek Inc	0.60%	8.48%	85.79%
2303-TW	United Microelectronics Corp.	0.15%	2.05%	87.84%
3711-TW	ASE Technology Holding Co., Ltd.	0.14%	1.94%	89.78%
6415-TW	Silergy Corp.	0.13%	1.83%	91.61%
5274-TW	ASPEED Technology, Inc.	0.08%	1.10%	92.71%
3034-TW	Novatek Microelectronics Corp.	0.07%	1.03%	93.74%
2379-TW	Realtek Semiconductor Corp	0.07%	0.95%	94.69%
3529-TW	eMemory Technology, Inc.	0.06%	0.83%	95.52%
4966-TW	Parade Technologies, Ltd.	0.05%	0.68%	96.19%

### Ch 3. Taiwan Semiconductors. Top 5 overweight and underweight positions in Taiwan Semiconductors, percentage of total

Ticker	Stock Name	Average Weight vs EEM	Percentage of Total
5274-TW	ASPEED Technology, Inc.	0.08%	15.1%
6415-TW	Silergy Corp.	0.06%	10.7%
2454-TW	MediaTek Inc	0.03%	6.2%
3661-TW	Alchip Technologies Ltd.	0.02%	4.1%
2337-TW	Macronix International Co., L.	0.02%	3.5%
3034-TW	Novatek Microelectronics Co.	-0.01%	2.8%
2344-TW	Winbond Electronics Corp.	-0.02%	4.8%
3711-TW	ASE Technology Holding Co.,...	-0.03%	5.1%
2303-TW	United Microelectronics Corp.	-0.13%	25.2%
2330-TW	Taiwan Semiconductor Man...	-0.66%	126.6%

### Ch 2. Taiwan Semiconductors: Aggregate Stock Holdings Data, Ranked by Most Widely Held.

Ticker	Stock Name	Funds Invested %	Average Weight	Vs Benchmark	Fund AUM, \$
2330-TW	Taiwan Semiconductor Manufacturing Co., L.	87.27%	5.48%	-0.66%	\$21,486.87M
2454-TW	MediaTek Inc	49.06%	0.60%	0.03%	\$2,733.61M
6415-TW	Silergy Corp.	23.22%	0.13%	0.06%	\$800.48M
2303-TW	United Microelectronics Corp.	22.85%	0.15%	-0.13%	\$304.99M
3711-TW	ASE Technology Holding Co., Ltd.	17.60%	0.14%	-0.03%	\$312.63M
2379-TW	Realtek Semiconductor Corp	16.48%	0.07%	-0.01%	\$171.68M
3034-TW	Novatek Microelectronics Corp.	13.48%	0.07%	-0.01%	\$134.89M
4966-TW	Parade Technologies, Ltd.	10.11%	0.05%	0.02%	\$100.54M
2408-TW	Nanya Technology Corporation	9.74%	0.04%	0.00%	\$68.41M
5274-TW	ASPEED Technology, Inc.	8.99%	0.08%	0.08%	\$176.92M
3529-TW	eMemory Technology, Inc.	7.49%	0.06%	0.01%	\$204.56M
5347-TW	Vanguard International Semiconductor Corp	7.12%	0.02%	-0.01%	\$70.42M
2344-TW	Winbond Electronics Corp.	6.74%	0.01%	-0.02%	\$21.73M
3105-TW	Win Semiconductors Corp.	4.87%	0.03%	0.00%	\$77.56M
2337-TW	Macronix International Co., Ltd.	4.49%	0.02%	0.02%	\$40.95M
6239-TW	Powertech Technology Inc.	4.12%	0.01%	0.01%	\$14.02M
5483-TW	Sino-American Silicon Products Inc.	3.75%	0.01%	0.01%	\$25.06M
3661-TW	Alchip Technologies Ltd.	3.37%	0.02%	0.02%	\$14.64M
3443-TW	Global Unichip Corp.	3.37%	0.01%	0.01%	\$21.68M
6147-TW	Chipbond Technology Corporation	3.00%	0.01%	0.01%	\$3.79M
3081-TW	LandMark Optoelectronics Corp.	2.62%	0.01%	0.01%	\$56.33M
5269-TW	Asmedia Technology Inc.	2.25%	0.00%	-0.01%	\$11.24M
4968-TW	Richwave Technology Corporation	2.25%	0.01%	0.01%	\$3.12M
SIM0-US	Silicon Motion Technology Corporation Spon..	1.87%	0.02%	0.02%	\$19.46M
8150-TW	ChipMOS Technologies, Inc.	1.87%	0.00%	0.00%	\$1.08M

### Ch 4. Taiwan Semiconductors: Aggregate Stock Holdings Data, Largest Overweight Holdings

Ticker	Stock Name	Vs Benchmark	Average Weight	Funds Invested %	Fund AUM, \$
5274-TW	ASPEED Technology, Inc.	0.08%	0.08%	8.99%	\$176.92M
6415-TW	Silergy Corp.	0.06%	0.13%	23.22%	\$800.48M
2454-TW	MediaTek Inc	0.03%	0.60%	49.06%	\$2,733.61M
3661-TW	Alchip Technologies Ltd.	0.02%	0.02%	3.37%	\$14.64M
2337-TW	Macronix International Co., Ltd.	0.02%	0.02%	4.49%	\$40.95M
4966-TW	Parade Technologies, Ltd.	0.02%	0.05%	10.11%	\$100.54M
SIM0-US	Silicon Motion Technology Corporation Spon..	0.02%	0.02%	1.87%	\$19.46M
6147-TW	Chipbond Technology Corporation	0.01%	0.01%	3.00%	\$3.79M
3443-TW	Global Unichip Corp.	0.01%	0.01%	3.37%	\$21.68M
3081-TW	LandMark Optoelectronics Corp.	0.01%	0.01%	2.62%	\$56.33M

### Ch 5. Taiwan Semiconductors: Aggregate Stock Holdings Data, Largest Underweight Holdings

Ticker	Stock Name	Vs Benchmark	Average Weight	Funds Invested %	Fund AUM, \$
2330-TW	Taiwan Semiconductor Manufacturing Co., L.	-0.66%	5.48%	87.27%	\$21,486.87M
2303-TW	United Microelectronics Corp.	-0.13%	0.15%	22.85%	\$304.99M
3711-TW	ASE Technology Holding Co., Ltd.	-0.03%	0.14%	17.60%	\$312.63M
2344-TW	Winbond Electronics Corp.	-0.02%	0.01%	6.74%	\$21.73M
3034-TW	Novatek Microelectronics Corp.	-0.01%	0.07%	13.48%	\$134.89M
5347-TW	Vanguard International Semiconductor Corp	-0.01%	0.02%	7.12%	\$70.42M
5269-TW	Asmedia Technology Inc.	-0.01%	0.00%	2.25%	\$11.24M
2379-TW	Realtek Semiconductor Corp	-0.01%	0.07%	16.48%	\$171.68M



Chart 1. Taiwan Semiconductors: The largest individual fund level stock holdings by fund weight, coloured by fund Style.

### Ch 1. Taiwan Semiconductors: Top Fund Holdings, %

Fund Name	Ticker	Stock Name	Weight (%)
Templeton Developing Markets Trust	2330-TW	Taiwan Semiconductor Man..	11.31%
JPMCB Emerging Markets Equity Focused Fund	2330-TW	Taiwan Semiconductor Man..	10.52%
Delaware Emerging Markets Fund	2330-TW	Taiwan Semiconductor Man..	9.91%
Raiffeisen Sustainable Emerging Markets Equities	2330-TW	Taiwan Semiconductor Man..	9.78%
TT International Funds Plc - Emerging Markets Unconstrained	2330-TW	Taiwan Semiconductor Man..	9.57%
Ashmore Emerging Markets Active Equity Fund	2330-TW	Taiwan Semiconductor Man..	9.55%
Fisher Invt. Instl. Fds. Plc - Emerging Markets Equity Fund	2330-TW	Taiwan Semiconductor Man..	9.53%
Artisan Sustainable Emerging Markets Fund	2330-TW	Taiwan Semiconductor Man..	9.49%
TT International Funds Plc - Emerging Markets Equity Fund	2330-TW	Taiwan Semiconductor Man..	9.40%
Vontobel Fund - mtx Sustainable Emerging Markets Leaders	2330-TW	Taiwan Semiconductor Man..	9.28%
Baillie Gifford Overseas Growth Funds ICVC - EM, Growth	2330-TW	Taiwan Semiconductor Man..	9.20%
Nordea Emerging Market Equities	2330-TW	Taiwan Semiconductor Man..	9.16%
Putnam Emerging Markets Equity Fund	2330-TW	Taiwan Semiconductor Man..	9.16%
Fidelity Institutional Funds - Emerging Markets Fund	2330-TW	Taiwan Semiconductor Man..	9.12%
JPMorgan Emerging Markets Equity Fund	2330-TW	Taiwan Semiconductor Man..	9.10%
First Trust Aberdeen Emerging Opportunity Fund	2330-TW	Taiwan Semiconductor Man..	9.09%
Baillie Gifford Overseas Growth Fund - Emer. Mkts. Leading Co.	2330-TW	Taiwan Semiconductor Man..	9.03%
WCM Focused Emerging Markets Fund	2330-TW	Taiwan Semiconductor Man..	8.94%
Calvert Emerging Markets Equity Fund	2330-TW	Taiwan Semiconductor Man..	8.92%
Jupiter Asset Mgmt. Series Plc - Global EM Focus Fd.	2330-TW	Taiwan Semiconductor Man..	8.84%
Goldman Sachs ESG Emerging Markets Equity Fund	2330-TW	Taiwan Semiconductor Man..	8.80%
TIAA-CREF Emerging Markets Equity Fund	2330-TW	Taiwan Semiconductor Man..	8.78%
Nordea 1 - Emerging Stars Equity Fund	2330-TW	Taiwan Semiconductor Man..	8.74%
Fisher Invt. Instl. Fds. Plc - Emerging Markets Eq. ESG Fund	2330-TW	Taiwan Semiconductor Man..	8.73%
Schroder ISF - Emerging Markets Equity Alpha	2330-TW	Taiwan Semiconductor Man..	8.73%
Polar Capital Funds Plc - Emerging Market Stars Fund	2330-TW	Taiwan Semiconductor Man..	8.72%
Ashmore SICAV - Emerging Markets Equity ESG Fund	2330-TW	Taiwan Semiconductor Man..	8.69%
Janus Henderson Emerging Markets Fund	2330-TW	Taiwan Semiconductor Man..	8.69%
Jupiter Global Emerging Markets Fund	2330-TW	Taiwan Semiconductor Man..	8.58%
Pictet - Emerging Markets	2330-TW	Taiwan Semiconductor Man..	8.56%
Franklin Templeton Fds. II - Martin Currie Emerging Mkts. Fd.	2330-TW	Taiwan Semiconductor Man..	8.55%
JPMorgan Funds - Emerging Markets Opportunities Fund	2330-TW	Taiwan Semiconductor Man..	8.43%
Schroder ISF - Emerging Markets	2330-TW	Taiwan Semiconductor Man..	8.42%
abrdn Emerging Markets Fund	2330-TW	Taiwan Semiconductor Man..	8.41%
Fidelity Inv. Trust - Emerging Markets Fund	2330-TW	Taiwan Semiconductor Man..	8.40%
GS Funds - Emerging Markets Equity Portfolio	2330-TW	Taiwan Semiconductor Man..	8.39%
Voya Investors Trust - JPMorgan Emerging Markets Equity P..	2330-TW	Taiwan Semiconductor Man..	8.39%
Schroder ISF - Global Emerging Market Opportunities	2330-TW	Taiwan Semiconductor Man..	8.37%
CT (Lux) III - Responsible Global Emerging Markets Equity	2330-TW	Taiwan Semiconductor Man..	8.29%
T Rowe Price Emerging Markets Stock Fund	2330-TW	Taiwan Semiconductor Man..	8.28%

Fund Style Aggressive Growth Growth GARP Value

Chart 2. Taiwan Semiconductors: The largest individual fund level stock holdings by \$ AUM, coloured by fund Style.

### Ch 2. Taiwan Semiconductors: Top Fund Holdings, \$

Fund Name	Ticker	Stock Name	AUM (\$)
Invesco Developing Markets Fund	2330-TW	Taiwan Semiconductor Manufac..	\$1,952.76M
Fidelity Inv. Trust - Emerging Markets Opportunities Fund	2330-TW	Taiwan Semiconductor Manufac..	\$1,798.77M
iShares MSCI Emerging Markets ETF	2330-TW	Taiwan Semiconductor Manufac..	\$1,442.08M
American Funds New World Fund	2330-TW	Taiwan Semiconductor Manufac..	\$950.36M
JPMorgan Emerging Markets Equity Fund	2330-TW	Taiwan Semiconductor Manufac..	\$759.25M
Invesco Developing Markets Fund	2454-TW	MediaTek Inc	\$678.79M
T Rowe Price Emerging Markets Stock Fund	2330-TW	Taiwan Semiconductor Manufac..	\$622.71M
GQG Partners Emerging Markets Equity Fund	2330-TW	Taiwan Semiconductor Manufac..	\$558.68M
Fidelity Inv. Trust - Emerging Markets Fund	2330-TW	Taiwan Semiconductor Manufac..	\$548.07M
MFS Emerging Markets Equity Fund	2330-TW	Taiwan Semiconductor Manufac..	\$497.72M
Delaware Emerging Markets Fund	2330-TW	Taiwan Semiconductor Manufac..	\$491.50M
Vontobel Fund - mtx Sustainable Emerging Markets Lea..	2330-TW	Taiwan Semiconductor Manufac..	\$426.40M
Schroder ISF - Emerging Markets	2330-TW	Taiwan Semiconductor Manufac..	\$353.14M
Federated Hermes Invt. Funds - Global Emerging Market..	2330-TW	Taiwan Semiconductor Manufac..	\$350.90M
Allspring Emerging Markets Equity Fund	2330-TW	Taiwan Semiconductor Manufac..	\$303.15M
Baron Emerging Markets Fund	2330-TW	Taiwan Semiconductor Manufac..	\$290.04M
GS Funds - Emerging Markets Equity Portfolio	2330-TW	Taiwan Semiconductor Manufac..	\$274.53M
Fidelity Institutional Funds - Emerging Markets Fund	2330-TW	Taiwan Semiconductor Manufac..	\$270.85M
Goldman Sachs Emerging Markets Equity Fund	2330-TW	Taiwan Semiconductor Manufac..	\$268.25M
Nordea 1 - Emerging Stars Equity Fund	2330-TW	Taiwan Semiconductor Manufac..	\$262.25M
BlackRock Emerging Markets Fund Inc.	2330-TW	Taiwan Semiconductor Manufac..	\$261.63M
JPMorgan Funds - Emerging Markets Opportunities Fund	2330-TW	Taiwan Semiconductor Manufac..	\$255.47M
abrdn Emerging Markets Fund	2330-TW	Taiwan Semiconductor Manufac..	\$247.08M
Delaware Emerging Markets Fund	2454-TW	MediaTek Inc	\$239.36M
Calvert Emerging Markets Equity Fund	2330-TW	Taiwan Semiconductor Manufac..	\$221.63M
American Century Emerging Markets Fund	2330-TW	Taiwan Semiconductor Manufac..	\$220.84M
Candriam Sustainable - Equity Emerging Market	2330-TW	Taiwan Semiconductor Manufac..	\$193.35M
JPMCB Emerging Markets Equity Focused Fund	2330-TW	Taiwan Semiconductor Manufac..	\$184.61M
JPMorgan Trust IV - Emerging Markets Research Enhanc..	2330-TW	Taiwan Semiconductor Manufac..	\$180.49M
Fidelity Inv. Trust - Emerging Markets Opportunities Fund	2454-TW	MediaTek Inc	\$171.24M
Principal Origin Emerging Markets Fund	2330-TW	Taiwan Semiconductor Manufac..	\$166.99M
BlackRock Global Funds - Emerging Markets Fund	2330-TW	Taiwan Semiconductor Manufac..	\$166.15M
Harding Loevner Institutional Emerging Markets Portfolio	2330-TW	Taiwan Semiconductor Manufac..	\$155.86M
TIAA-CREF Emerging Markets Equity Fund	2330-TW	Taiwan Semiconductor Manufac..	\$146.87M
American Funds New World Fund	6415-TW	Silergy Corp.	\$140.07M
WCM Focused Emerging Markets Fund	2330-TW	Taiwan Semiconductor Manufac..	\$140.06M
iShares MSCI Emerging Markets ETF	2454-TW	MediaTek Inc	\$133.56M
Touchstone Strategic Trust - Sands Capital E.M. Growth ..	2330-TW	Taiwan Semiconductor Manufac..	\$128.75M
Schroder ISF - Global Emerging Market Opportunities	2330-TW	Taiwan Semiconductor Manufac..	\$128.50M
Robeco Capital Gr. Fds. - Emerging Stars Equities	2330-TW	Taiwan Semiconductor Manufac..	\$127.90M

Fund Style Aggressive Growth Growth GARP Value

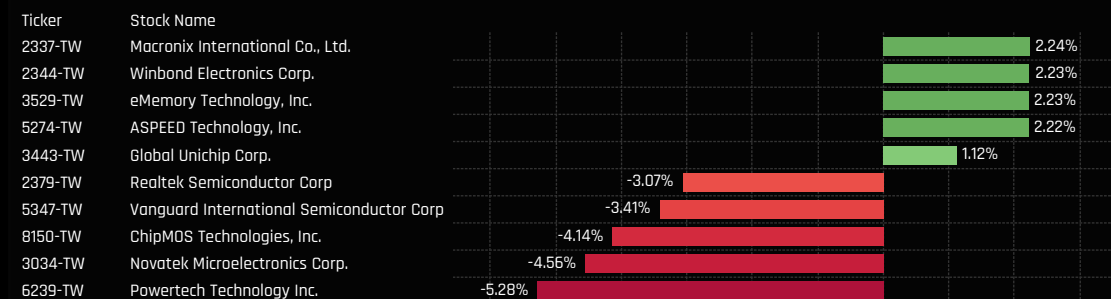
Chart 1. The 10 Taiwan Semiconductors stocks seeing the largest changes in funds invested % between 11/30/2021 - 11/30/2022. A positive figure shows more funds buying in to the stock, a negative figure funds closing out.

Chart 2. The largest increases in funds invested %, together with average weight changes, relative to benchmark changes and combined fund flows.

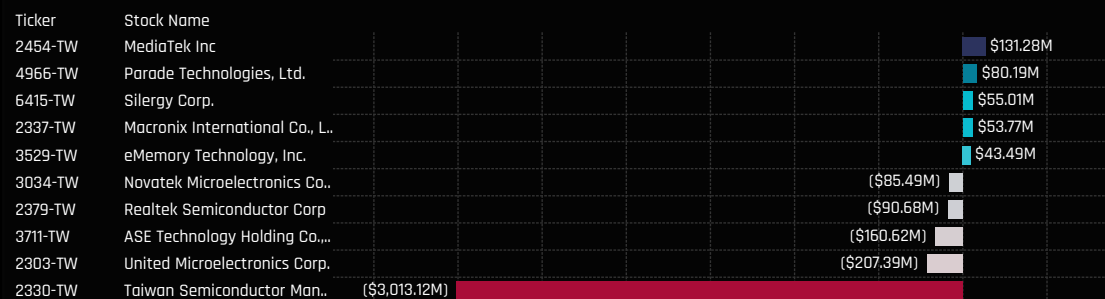
Chart 3. The 10 Taiwan Semiconductors stocks seeing the largest USD fund flows between 11/30/2021 - 11/30/2022.

Chart 4. The largest decreases in funds invested %, together with average weight changes, relative to benchmark changes and combined fund flows.

## Ch 1. Taiwan Semiconductors: Largest Changes in Funds Invested %



## Ch 3 Taiwan Semiconductors: Largest Combined Fund Flows in USD.



## Ch 2. Taiwan Semiconductors: Aggregate Stock Holdings Changes - Largest Increases in Funds Invested %.

Ticker	Stock Name	Funds Invested % Δ	Average Weight Δ	Average Wgt vs Benchmark Δ	Fund Flows, \$
2337-TW	Macronix International Co., Ltd.	2.24%	0.01%	0.01%	\$53.77M
2344-TW	Winbond Electronics Corp.	2.23%	0.00%	0.01%	\$13.63M
3529-TW	eMemory Technology, Inc.	2.23%	-0.01%	-0.06%	\$43.49M
5274-TW	ASPEED Technology, Inc.	2.22%	-0.03%	-0.03%	(\$9.47M)
3443-TW	Global Unichip Corp.	1.12%	0.00%	0.00%	(\$2.36M)
2330-TW	Taiwan Semiconductor Manufacturing Co., L..	0.80%	-0.65%	0.14%	(\$3,013.12M)
2408-TW	Nanya Technology Corporation	0.72%	-0.02%	-0.01%	(\$9.67M)
8110-TW	Walton Advanced Engineering, Inc.	0.37%	0.00%	0.00%	\$0.02M
4564-TW	Mosa Industrial Corp.	0.37%	0.00%	0.00%	\$0.01M
3592-TW	Raydium Semiconductor Corp.	0.37%	0.00%	0.00%	\$0.59M
3026-TW	Holy Stone Enterprise Co., Ltd.	0.37%	0.00%	0.00%	\$0.04M
2388-TW	VIA Technologies, Inc.	0.37%	0.00%	0.00%	\$0.54M
5483-TW	Sino-American Silicon Products Inc.	0.36%	-0.01%	-0.01%	\$11.25M
IMOS.XXI-US	Chipmos Technologies (Bermuda) Ltd.	0.00%	0.00%	0.00%	
8261-TW	Advanced Power Electronics Corp	0.00%	0.00%	0.00%	\$0.00M
8255-TW	Actron Technology Corporation	0.00%	0.00%	0.00%	
8249-TW	Creative Sensor Inc.	0.00%	0.00%	0.00%	
6643-TW	M31 Technology Corp.	0.00%	0.00%	0.00%	
6568-TW	Rafael Microelectronics, Inc.	0.00%	0.00%	0.00%	
6485-TW	ASolid Technology Co Ltd	0.00%	0.00%	0.00%	
6462-TW	Egis Technology, Inc.	0.00%	0.00%	0.00%	
6286-TW	Richtek Technology Corp.	0.00%	0.00%	0.00%	
6244-TW	Motech Industries, Inc.	0.00%	0.00%	0.00%	
6238-TW	Kingpak Technology Inc.	0.00%	0.00%	0.00%	
6182-TW	Wafer Works Corp.	0.00%	0.00%	0.00%	\$0.01M

## Ch 4. Taiwan Semiconductors: Aggregate Stock Holdings Changes - Largest Decreases in Funds Invested %.

Ticker	Stock Name	Funds Invested % Δ	Average Weight Δ	Average Wgt vs Benchmark Δ	Fund Flows, \$
6239-TW	Powertech Technology Inc.	-5.28%	-0.01%	0.02%	(\$39.40M)
3034-TW	Novatek Microelectronics Corp.	-4.56%	-0.04%	0.00%	(\$85.49M)
8150-TW	ChipMOS Technologies, Inc.	-4.14%	-0.01%	-0.01%	(\$16.82M)
5347-TW	Vanguard International Semiconductor Corp	-3.41%	-0.03%	-0.01%	(\$54.61M)
2379-TW	Realtek Semiconductor Corp	-3.07%	-0.09%	-0.04%	(\$90.68M)
3105-TW	Win Semiconductors Corp.	-3.03%	-0.05%	-0.01%	(\$25.82M)
SIM0-US	Silicon Motion Technology Corporation Spon..	-3.01%	-0.02%	-0.02%	(\$20.62M)
2303-TW	United Microelectronics Corp.	-2.72%	-0.09%	-0.01%	(\$207.39M)
2454-TW	MediaTek Inc	-2.06%	-0.30%	-0.15%	\$131.28M
2458-TW	ELAN Microelectronics Corp.	-1.88%	-0.01%	-0.01%	(\$8.15M)
3222-TW	Himax Techns Twd10	-1.88%	0.00%	0.00%	(\$16.83M)
6147-TW	Chipbond Technology Corporation	-1.52%	-0.02%	-0.02%	(\$75.43M)
6202-TW	Holtek Semiconductor Inc.	-1.51%	0.00%	0.00%	(\$6.15M)
5269-TW	Asmedia Technology Inc.	-1.14%	-0.01%	0.01%	(\$50.98M)
5434-TW	Topco Scientific Co., Ltd.	-1.13%	-0.01%	-0.01%	(\$9.37M)
8016-TW	Sitronix Technology Corp.	-1.13%	-0.01%	-0.01%	(\$6.34M)
8081-TW	Global Mixed-Mode Technology, Inc.	-1.13%	0.00%	0.00%	(\$12.03M)
3545-TW	FocalTech Systems Co., Ltd.	-1.13%	0.00%	0.00%	(\$6.95M)
6116-TW	Hannstar Display Corp.	-1.13%	0.00%	0.00%	(\$3.99M)
6415-TW	Silergy Corp.	-0.84%	-0.22%	-0.12%	\$55.01M
3081-TW	LandMark Optoelectronics Corp.	-0.76%	-0.01%	-0.01%	(\$23.27M)
4968-TW	Richwave Technology Corporation	-0.76%	-0.01%	-0.01%	(\$7.51M)
2393-TW	Everlight Electronics Co., Ltd.	-0.76%	0.00%	0.00%	(\$0.63M)
2441-TW	Greattek Electronics, Inc.	-0.76%	0.00%	0.00%	(\$5.08M)
6732-TW	Sensortek Technology Corp.	-0.75%	0.00%	0.00%	(\$0.21M)

# Taiwan Semiconductors

# Fund Level Stock Holding Changes

Chart 1. The largest fund weight increases in Taiwan Semiconductors stocks between 11/30/2021 - 11/30/2022.  
 Chart 2. The largest fund weight decreases in Taiwan Semiconductors stocks between 11/30/2021 - 11/30/2022  
 Both charts show the current weight and whether the weight change represented a new or closed position.

## Ch 1. Taiwan Semiconductors: Largest Increases in Position, %

Fund Name	Ticker	Stock Name	New or Close..	Latest Weight	Weight Change
Virtus NFJ Emerging Markets Value Fund	2330-TW	Taiwan Semiconductor Man..		6.94%	4.68%
First Sentier Investors ICVC - Stewart Inv. Glob. E..	2330-TW	Taiwan Semiconductor Man..	New	4.29%	4.29%
Jupiter Global Emerging Markets Fund	2330-TW	Taiwan Semiconductor Man..		8.58%	4.18%
AMG GW&K Emerging Wealth Equity Fund	2330-TW	Taiwan Semiconductor Man..		4.62%	4.06%
Carmignac Emergents	2330-TW	Taiwan Semiconductor Man..	New	3.96%	3.96%
PineBridge Global Funds - Global Emer. Mkts. Foc..	2330-TW	Taiwan Semiconductor Man..	New	3.89%	3.89%
Artemis Investment Funds ICVC - Global Emergin..	2330-TW	Taiwan Semiconductor Man..		4.09%	3.35%
Jupiter Global Emerging Markets Fund	5274-TW	ASPEED Technology, Inc.	New	3.18%	3.18%
First State Investments ICVC - Global Emerging ..	2330-TW	Taiwan Semiconductor Man..	New	3.13%	3.13%
Sunbridge Capital Emerging Markets Fund	2330-TW	Taiwan Semiconductor Man..	New	3.05%	3.05%
White Fleet - OLZ Equity Emerging Market Optimi..	2330-TW	Taiwan Semiconductor Man..	New	2.72%	2.72%
Nordea 1 - Emerging Stars Equity Fund	2454-TW	MediaTek Inc	New	2.29%	2.29%
M&G Investment Funds (7) DEIC - Global Emergin..	2330-TW	Taiwan Semiconductor Man..		3.54%	2.07%
UNI-GLOBAL - Equities Emerging Markets	2330-TW	Taiwan Semiconductor Man..		5.23%	1.98%
Candriam Equities L - Emerging Markets	2330-TW	Taiwan Semiconductor Man..		6.68%	1.85%
Delaware Pooled Emerging Markets Portfolio	2454-TW	MediaTek Inc	New	1.78%	1.78%
CIF - Emerging Markets Growth Fund (LUX)	2330-TW	Taiwan Semiconductor Man..		4.77%	1.77%
Mondrian Emerging Markets Value Equity Fund	2454-TW	MediaTek Inc	New	1.67%	1.67%
Ashmore Emerging Markets Active Equity Fund	2330-TW	Taiwan Semiconductor Man..		9.55%	1.59%
Lazard Emerging Markets Strategic Equity Portfo..	2454-TW	MediaTek Inc	New	1.58%	1.58%

## Ch 2. Taiwan Semiconductors: Largest Decreases in Position, %

Fund Name	Ticker	Stock Name	New or Close..	Latest Weight	Weight Change
Amana Developing World Fund	6415-TW	Silergy Corp.	Close	0.00%	-9.40%
PGIM Jennison Emerging Markets Equity Opportu..	6415-TW	Silergy Corp.	Close	0.00%	-6.23%
PGIM Jennison Emerging Markets Equity Opportu..	2330-TW	Taiwan Semiconductor Man..	Close	0.00%	-5.27%
Jupiter Global Emerging Markets Fund	2454-TW	MediaTek Inc	Close	0.00%	-4.65%
Liontrust Investment Funds II - Emerging Market..	2330-TW	Taiwan Semiconductor Man..		3.56%	-4.41%
Virtus Vontobel Emerging Markets Opportunities ..	2330-TW	Taiwan Semiconductor Man..		4.86%	-4.23%
Vontobel Fund - Emerging Markets Equity	2330-TW	Taiwan Semiconductor Man..		5.03%	-3.82%
Amonis Equity Emerging Markets	2330-TW	Taiwan Semiconductor Man..		2.00%	-3.76%
PineBridge Global Funds - Global Emer. Mkts. Foc..	6415-TW	Silergy Corp.	Close	0.00%	-3.72%
DNB Fund - Emerging Markets Equities	2330-TW	Taiwan Semiconductor Man..		3.18%	-3.62%
William Blair Emerging Markets Growth Fund	2454-TW	MediaTek Inc	Close	0.00%	-3.50%
Orbis SICAV - Emerging Markets Equity Fund	2330-TW	Taiwan Semiconductor Man..		3.33%	-3.25%
Morgan Stanley Instl. Fund - Emerging Markets L..	6415-TW	Silergy Corp.		1.73%	-3.11%
Pictet - Emerging Markets	2303-TW	United Microelectronics Corp.	Close	0.00%	-2.91%
BNY Mellon Emerging Markets Fund	2330-TW	Taiwan Semiconductor Man..		6.13%	-2.89%
Liontrust Investment Funds II - Emerging Market..	2454-TW	MediaTek Inc	Close	0.00%	-2.88%
William Blair Emerging Markets Leaders Fund	2330-TW	Taiwan Semiconductor Man..		5.90%	-2.83%
T Rowe Price Emerging Markets Stock Fund	2330-TW	Taiwan Semiconductor Man..		8.28%	-2.82%
LO Funds - Emerging High Conviction	2330-TW	Taiwan Semiconductor Man..		6.89%	-2.82%
WCM Focused Emerging Markets Fund	6415-TW	Silergy Corp.		0.94%	-2.81%

Chart 3. The largest buyers in US dollar terms in Taiwan Semiconductors stocks between 11/30/2021 - 11/30/2022.  
 Chart 4. The largest sellers in US dollar terms in Taiwan Semiconductors stocks between 11/30/2021 - 11/30/2022  
 Both charts show the current AUM and whether the fund flow represented a new or closed position.

## Ch 3. Taiwan Semiconductors: Largest Fund Inflows, \$

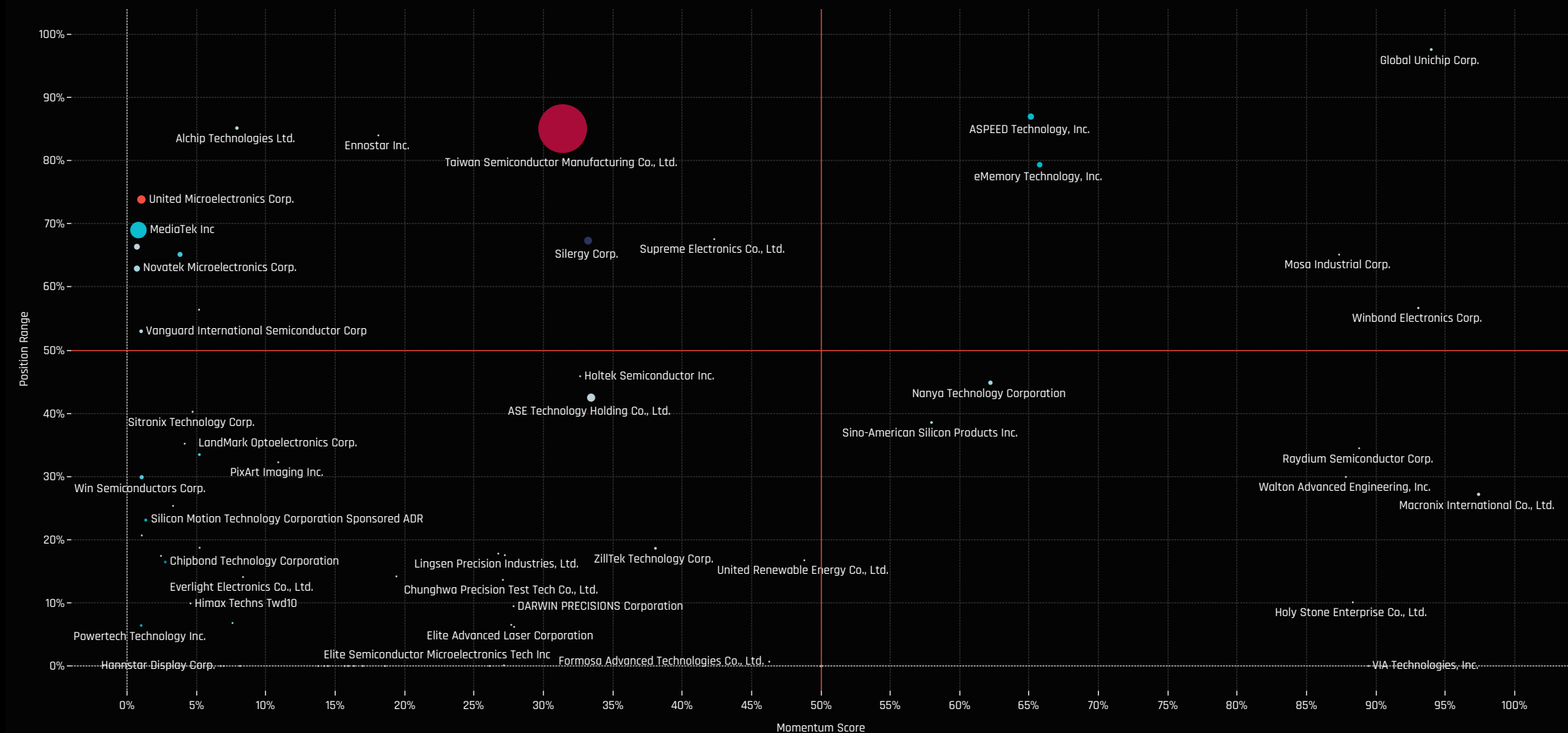
Fund Name	Ticker	Stock Name	New or Close..	Latest AUM, \$	Fund Flows, \$
Invesco Developing Markets Fund	2454-TW	MediaTek Inc		\$679M	\$521M
Fidelity Inv. Trust - Emerging Markets Opportunies..	2330-TW	Taiwan Semiconductor Man..		\$1,799M	\$302M
Invesco Developing Markets Fund	6415-TW	Silergy Corp.	New	\$125M	\$209M
Nordea 1 - Emerging Stars Equity Fund	2454-TW	MediaTek Inc	New	\$69M	\$123M
American Funds New World Fund	2330-TW	Taiwan Semiconductor Man..		\$950M	\$118M
JPMorgan Emerging Markets Equity Fund	6415-TW	Silergy Corp.		\$111M	\$97M
JPMorgan Emerging Markets Equity Fund	2379-TW	Realtek Semiconductor Corp	New	\$49M	\$90M
GQG Partners Emerging Markets Equity Fund	2330-TW	Taiwan Semiconductor Man..		\$559M	\$97M
Candriam Sustainable - Equity Emerging Market	2330-TW	Taiwan Semiconductor Man..		\$193M	\$78M
JPMorgan Emerging Markets Equity Fund	2330-TW	Taiwan Semiconductor Man..		\$759M	\$75M
T Rowe Price Emerging Markets Stock Fund	6415-TW	Silergy Corp.	New	\$38M	\$73M
Fidelity SAI Emerging Markets Value Index Fund	2330-TW	Taiwan Semiconductor Man..		\$106M	\$57M
GS Funds - Emerging Markets CORE Equity Portfolio	2330-TW	Taiwan Semiconductor Man..		\$120M	\$56M
Vontobel Fund - mtx Sustainable Emerging Market..	4966-TW	Parade Technologies, Ltd.	New	\$27M	\$55M
Federated Hermes Invt. Funds - Global Emerging M..	6415-TW	Silergy Corp.	New	\$16M	\$55M
T Rowe Price Emerging Markets Discovery Stock Fu..	2454-TW	MediaTek Inc		\$87M	\$55M
Fidelity Inv. Trust - Emerging Markets Opportunies..	6415-TW	Silergy Corp.		\$47M	\$51M
Federated Hermes Invt. Funds - Global Emerging M..	3105-TW	Win Semiconductors Corp.	New	\$20M	\$48M
Goldman Sachs Emerging Markets Equity Fund	2330-TW	Taiwan Semiconductor Man..		\$268M	\$48M
Carmignac Emergents	2330-TW	Taiwan Semiconductor Man..	New	\$34M	\$47M

## Ch 4. Taiwan Semiconductors: Largest Fund Outflows, \$

Fund Name ..	Fund Name	Ticker	Stock Name	New or Close..	Latest AUM, \$	Fund Flows, \$
Invesco Deve..	Invesco Developing Markets Fund	2330-TW	Taiwan Semiconductor Man..		\$1,953M	(\$1,340M)
T Rowe Price ..	T Rowe Price Emerging Markets Sto..	2330-TW	Taiwan Semiconductor Man..		\$623M	(\$389M)
American Fu..	American Funds New World Fund	6415-TW	Silergy Corp.		\$140M	(\$386M)
Virtus Vonto..	Virtus Vontobel Emerging Markets O..	2330-TW	Taiwan Semiconductor Man..		\$98M	(\$270M)
Nordea 1 - E..	Nordea 1 - Emerging Stars Equity Fu..	2330-TW	Taiwan Semiconductor Man..		\$262M	(\$211M)
Harding Loev..	Harding Loevner Institutional Emer..	2330-TW	Taiwan Semiconductor Man..		\$156M	(\$133M)
Vontobel Fun..	Vontobel Fund - Emerging Markets ..	2330-TW	Taiwan Semiconductor Man..		\$67M	(\$124M)
Fidelity Inv. T..	Fidelity Inv. Trust - Emerging Market..	2303-TW	United Microelectronics Corp.		\$5M	(\$120M)
JPMorgan Fu..	JPMorgan Funds - Emerging Market..	2330-TW	Taiwan Semiconductor Man..		\$255M	(\$114M)
Touchstone ..	Touchstone Strategic Trust - Sands ..	2330-TW	Taiwan Semiconductor Man..		\$129M	(\$108M)
Delaware Ivy..	Delaware Ivy Emerging Markets Equ..	2330-TW	Taiwan Semiconductor Man..		\$79M	(\$90M)
abrdn Emerg..	abrdn Emerging Markets Fund	2330-TW	Taiwan Semiconductor Man..		\$247M	(\$88M)
Schroder ISF ..	Schroder ISF - Emerging Markets	2454-TW	MediaTek Inc		\$15M	(\$86M)
Comgest Gro..	Comgest Growth Plc - Emerging Mar..	2330-TW	Taiwan Semiconductor Man..		\$57M	(\$85M)
Orbis SICAV ..	Orbis SICAV - Emerging Markets Equ..	2330-TW	Taiwan Semiconductor Man..		\$73M	(\$77M)
Fidelity Inv. T..	Fidelity Inv. Trust - Emerging Market..	3711-TW	ASE Technology Holding Co.,...	Close		(\$65M)
Causeway E..	Causeway Emerging Markets Fund	2330-TW	Taiwan Semiconductor Man..		\$103M	(\$64M)
Baron Emerg..	Baron Emerging Markets Fund	2330-TW	Taiwan Semiconductor Man..		\$290M	(\$63M)
Vontobel Fun..	Vontobel Fund - mtx Sustainable E..	2454-TW	MediaTek Inc		\$127M	(\$58M)
Pacific Select..	Pacific Select Fund - Emerging Mark..	2330-TW	Taiwan Semiconductor Man..		\$50M	(\$55M)

Z-Score of today's average weight, funds invested % and funds o/w % relative to all monthly observations in our fund history (going back to 1/31/2008). A figure close to 100% would indicate today's positioning is close to its maximum ever level, a figure close to zero, the lowest. The X-axis provides a measure of short-term fund activity, or 'Momentum', by looking at the changes in average weight, funds invested % and funds o/w % between 11/30/2021 and 11/30/2022, relative to each stock. A figure above 50% means a stock has seen relative increases in ownership, a figure below 50% indicates a relative decrease in positioning. The size of the bubble represents the average weight of each stock. The colour represents if the stock is held overweight (blue) or underweight (red) on average.

Country Industry: Taiwan Semiconductors  
 Stock Sentiment Grid. GEM Active Funds  
 Momentum Measure between 11/30/2021 - 11/30/2022



Position Range: Average of:  
 Z-Score Average Weight vs history  
 Z-Score Funds Invested % vs history  
 Z-Score Funds O/W % vs history

Momentum Score: Average of:  
 Change in Average Weight (Percentile vs Peers)  
 Change in Funds Invested % (Percentile vs Peers)  
 Change in Funds O/W % (Percentile vs Peers)

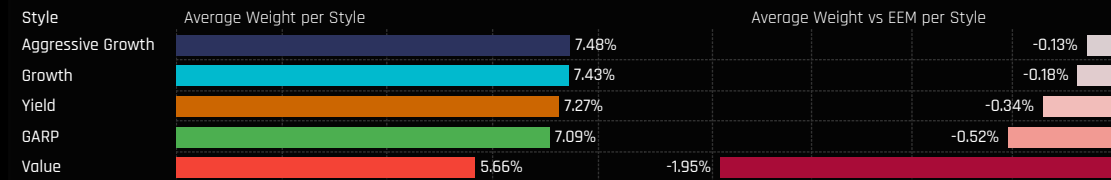
# Taiwan Semiconductors

# Holdings by Fund Style

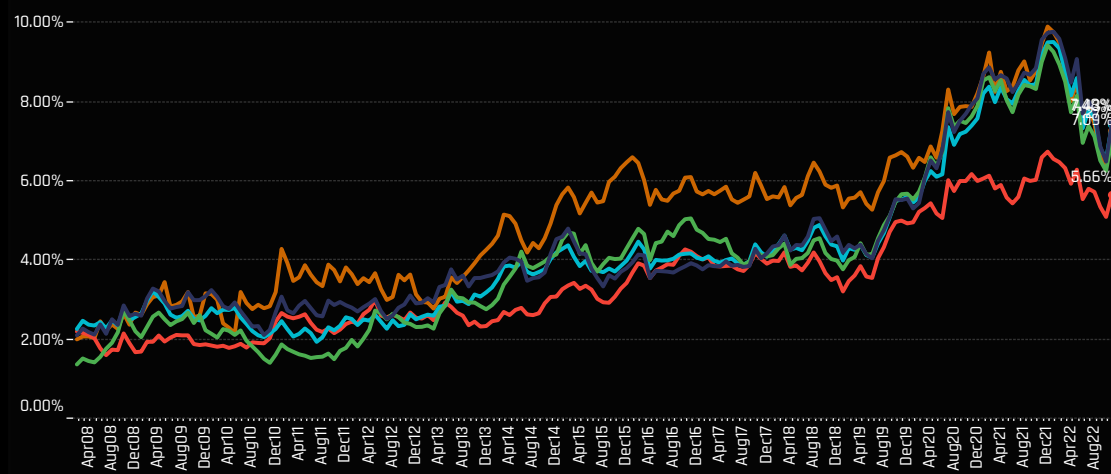
Chart 1. The average weights in Taiwan Semiconductors stocks and the average weights vs the iShares MSCI Emerging Markets ETF, split by fund Style.

Charts 2&3. The time series of average fund weights in Taiwan Semiconductors stocks and average weights vs iShares MSCI Emergi..

Ch 1. Taiwan Semiconductors: Average Fund Weight / Average Fund Weight vs EEM, per fund Style group.



Ch 2. Taiwan Semiconductors: Average Fund Weights per Style Time-Series



Ch 3. Taiwan Semiconductors: Average Fund Weight vs EEM per Style Time-Series

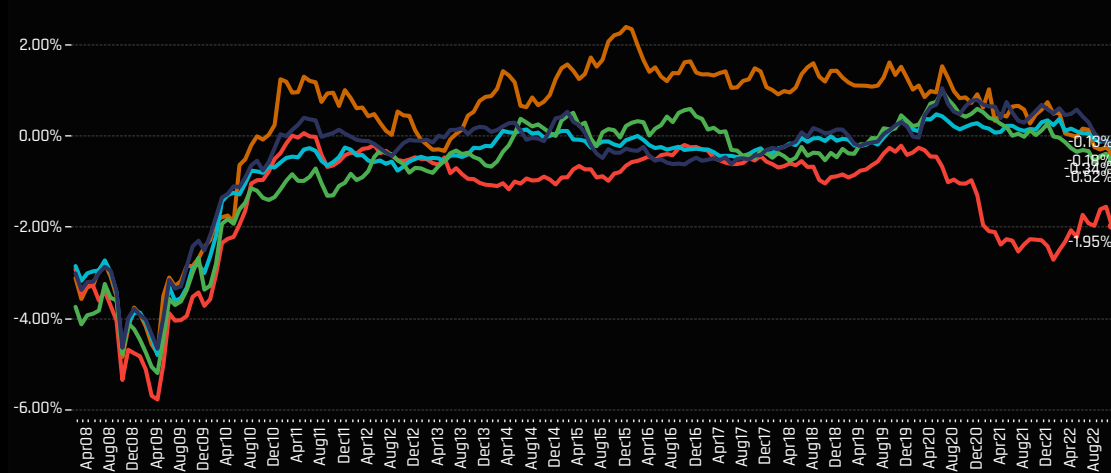
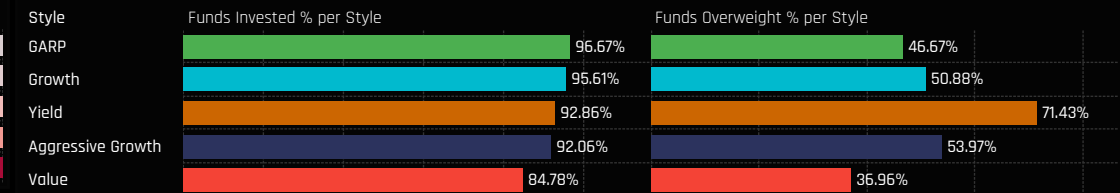


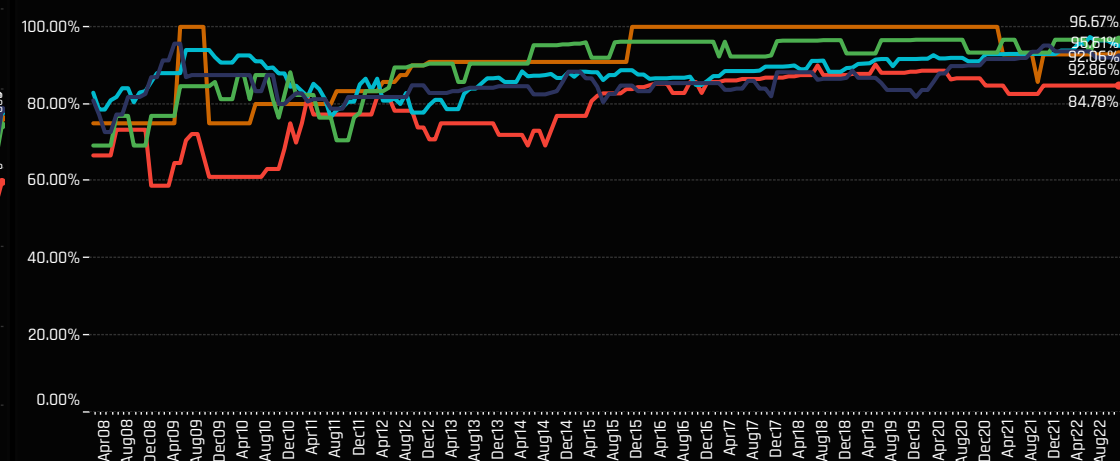
Chart 4. The percentage of funds invested in Taiwan Semiconductors stocks and the percentage of funds overweight, split by fund Style.

Charts 5&6. The time series of the percentage of funds invested in Taiwan Semiconductors stocks and the percentage of funds over..

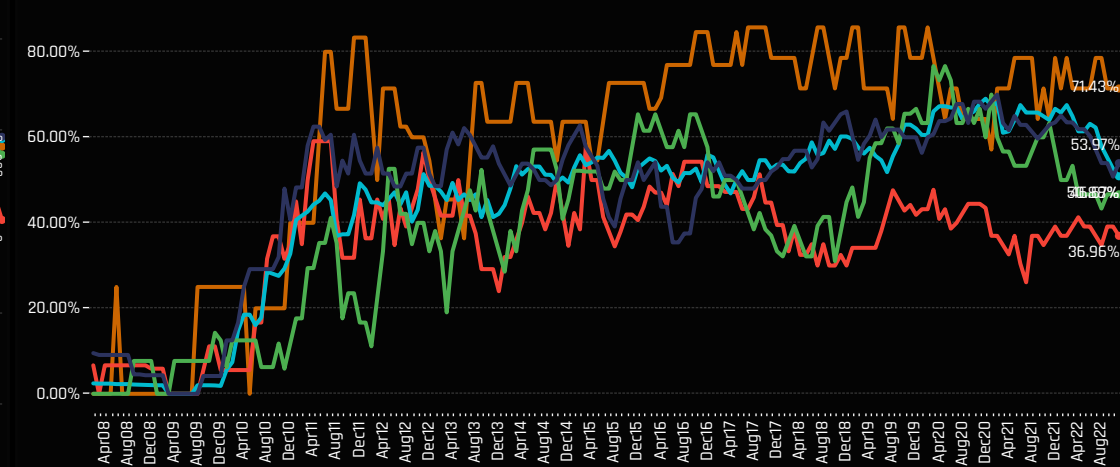
Ch 4. Taiwan Semiconductors: Funds Invested % / Funds Overweight %, per fund Style group.



Ch 5. Taiwan Semiconductors: Funds Invested % per Style Time-Series



Ch 6. Taiwan Semiconductors: Funds Overweight % per Style Time-Series



# Taiwan Semiconductors

# Holdings by Fund Style

Top Row: For each Style category, each chart shows the largest holders in the Taiwan Semiconductors Country Industry group.

Middle Row: For each Style category, each chart shows the most widely held stocks and the corresponding average fund weights in the Taiwan Semiconductors Country Industry group.

Bottom Row: For each Style category, each chart shows the largest stock overweights and underweights in the Taiwan Semiconductors Country Industry group.

## Taiwan Semiconductors Top Holders: Aggressive Growth

Fund Name	Weight
Polar Capital Funds Plc - Emergi..	14.72%
Mobius SICAV - Emerging Marke..	13.71%
Nordea 1 - Emerging Stars Equit..	13.48%
Jupiter Asset Mgmt. Series Plc -.	12.79%
JPMorgan Funds - Emerging Ma..	12.75%
Jupiter Global Emerging Market..	12.51%
AB FCP I - Emerging Markets Gr..	11.62%
Fidelity Inv. Trust - Emerging Ma..	11.16%
JPMorgan Emerging Markets Eq..	11.02%
CT (Lux) III - Responsible Global ..	10.84%
Ashmore SICAV - Emerging Mar..	10.71%

## Taiwan Semiconductors Top Holders: Growth

Fund Name	Weight
Fisher Invts. Instl. Fds. Plc - Eme..	16.72%
Templeton Developing Markets ..	15.34%
Fisher Invts. Instl. Fds. Plc - Eme..	14.62%
UBS Investment Funds ICVC - Gl..	12.99%
Fidelity Institutional Funds - Em..	12.86%
Vontobel Fund - mtx Sustainabl..	12.64%
Artisan Sustainable Emerging M..	12.62%
Goldman Sachs ESG Emerging ..	12.17%
John Hancock Emerging Market..	11.49%
Baillie Gifford Overseas Growth ..	11.44%
Raiffeisen Sustainable Emergin..	11.43%

## Taiwan Semiconductors Top Holders: GARP

Fund Name	Weight
Delaware Emerging Markets Fund	14.73%
TIAA-CREF Emerging Markets Eq..	12.22%
SEB Emerging Marketsfond	10.69%
Celsius Invnt. Fd. SICAV - Sustaina..	10.26%
Principal Origin Emerging Market..	9.06%
Old Mut. MultiManager Tr.-Quil. In..	8.90%
BNY Mellon Emerging Markets Fu..	8.41%
Daktree (Lux.) Funds - Emerging ..	8.38%
Schroder ISF - Global Emerging ..	8.37%
USAA Emerging Markets Fund	7.97%
Swisscanto Sammelstiftung Eme..	7.86%

## Taiwan Semiconductors Top Holders: Value

Fund Name	Weight
BNY Mellon Emerging Markets S..	11.32%
Nordea Emerging Market Equities	10.90%
Mondrian Emerging Markets Valu..	9.75%
Virtus NFJ Emerging Markets Val..	9.69%
Russell Invnt. Co. Plc - Acadian Su..	9.50%
Robeco Capital Gr. Fds. - Emergin..	9.42%
KBI Funds ICAV - Emerging Mark..	9.18%
Robeco Capital Gr. Fds. - Sustain..	9.15%
Causeway Emerging Markets Fu..	9.04%
Robeco Capital Gr. Fds. - QI Emer..	8.78%
Robeco Capital Gr. Fds. - QI EM S..	8.63%

## Taiwan Semiconductors Top Holders: Yield

Fund Name	Weight
JPMorgan Fund ICVC - Emerging ..	10.93%
Allianz Global Investors Fund - G..	8.71%
Allianz Global Investors Fund - E..	8.56%
Aviva Investors - Global Emergin..	8.49%
NN(L) SICAV - Emerging Markets ..	8.42%
Pictet Global Selection Fund - Gl..	8.38%
WisdomTree Tr. - Emerging Mark..	8.22%
BNY Mellon Investment Fds. - Em..	8.07%
Allspring (Lux) Ww. Fd. - EM Equi..	8.04%
Magna Umbrella Fund Plc - Emer..	7.74%
BlackRock Global Funds - Emergi..	6.87%

## Taiwan Semiconductors Most Widely Held Stocks: Aggressive Growth

Stock Name	Ave. Wgt	Funds Inv. %
Taiwan Semiconductor Manufact..	5.92%	88.89%
Silergy Corp.	0.32%	34.92%
MediaTek Inc	0.39%	26.98%
ASPEED Technology, Inc.	0.24%	17.46%
Parade Technologies, Ltd.	0.11%	11.11%
eMemory Technology, Inc.	0.17%	9.52%
Win Semiconductors Corp.	0.11%	7.94%
Realtek Semiconductor Corp	0.06%	7.94%
LandMark Optoelectronics Corp.	0.03%	4.76%
Vanguard International Semicon..	0.02%	3.17%

## Taiwan Semiconductors Most Widely Held Stocks: Growth

Stock Name	Ave. Wgt	Funds Inv. %
Taiwan Semiconductor Manufact..	5.93%	90.35%
MediaTek Inc	0.78%	62.28%
Silergy Corp.	0.12%	30.70%
United Microelectronics Corp.	0.12%	25.44%
Realtek Semiconductor Corp	0.07%	21.05%
ASE Technology Holding Co., Ltd.	0.13%	16.67%
Novatek Microelectronics Corp.	0.05%	14.91%
Parade Technologies, Ltd.	0.03%	14.04%
Nanya Technology Corporation	0.03%	10.53%
eMemory Technology, Inc.	0.03%	9.65%

## Taiwan Semiconductors Most Widely Held Stocks: GARP

Stock Name	Ave. Wgt	Funds Inv. %
Taiwan Semiconductor Manufact..	5.48%	90.00%
MediaTek Inc	0.83%	63.33%
United Microelectronics Corp.	0.20%	36.67%
ASE Technology Holding Co., Ltd.	0.19%	33.33%
Realtek Semiconductor Corp	0.05%	20.00%
Winbond Electronics Corp.	0.01%	16.67%
Sino-American Silicon Products I..	0.04%	16.67%
Nanya Technology Corporation	0.06%	16.67%
Silergy Corp.	0.04%	13.33%
Novatek Microelectronics Corp.	0.02%	13.33%

## Taiwan Semiconductors Most Widely Held Stocks: Value

Stock Name	Ave. Wgt	Funds Inv. %
Taiwan Semiconductor Manufact..	3.83%	73.91%
United Microelectronics Corp.	0.39%	39.13%
MediaTek Inc	0.33%	32.61%
ASE Technology Holding Co., Ltd.	0.25%	25.09%
Novatek Microelectronics Corp.	0.15%	21.74%
Macronix International Co., Ltd.	0.09%	17.39%
Nanya Technology Corporation	0.06%	15.22%
Winbond Electronics Corp.	0.03%	13.04%
Sino-American Silicon Products I..	0.04%	10.87%
Realtek Semiconductor Corp	0.07%	10.87%

## Taiwan Semiconductors Most Widely Held Stocks: Yield

Stock Name	Ave. Wgt	Funds Inv. %
Taiwan Semiconductor Manufact..	5.37%	92.86%
MediaTek Inc	0.52%	64.29%
ASE Technology Holding Co., Ltd.	0.29%	42.86%
Realtek Semiconductor Corp	0.15%	28.57%
Novatek Microelectronics Corp.	0.39%	28.57%
Vanguard International Semicon..	0.12%	21.43%
United Microelectronics Corp.	0.07%	21.43%
Nanya Technology Corporation	0.11%	14.29%
Chipbond Technology Corporation	0.22%	14.29%
Winbond Electronics Corp.	0.01%	7.14%

## Taiwan Semiconductors Top Over/Underweights: Aggressive Growth

Stock Name	Over/Underweight
ASPEED Technology, Inc.	0.24%
Silergy Corp.	0.24%
eMemory Technology, Inc.	0.13%
Parade Technologies, Ltd.	0.08%
Win Semiconductors Corp.	0.08%
Novatek Microelectronics Corp.	-0.07%
ASE Technology Holding Co., Ltd.	-0.16%
MediaTek Inc	-0.18%
Taiwan Semiconductor Manufact..	-0.22%
United Microelectronics Corp.	-0.28%

## Taiwan Semiconductors Top Over/Underweights: Growth

Stock Name	Over/Underweight
MediaTek Inc	0.21%
Silergy Corp.	0.04%
ASPEED Technology, Inc.	0.03%
Alchip Technologies Ltd.	0.02%
LandMark Optoelectronics Corp.	0.01%
Winbond Electronics Corp.	-0.03%
ASE Technology Holding Co., Ltd.	-0.04%
Novatek Microelectronics Corp.	-0.04%
United Microelectronics Corp.	-0.15%
Taiwan Semiconductor Manufact..	-0.21%

## Taiwan Semiconductors Top Over/Underweights: GARP

Stock Name	Over/Underweight
MediaTek Inc	0.26%
Sino-American Silicon Products I..	0.04%
ASE Technology Holding Co., Ltd.	0.03%
Nanya Technology Corporation	0.03%
Silicon Motion Technology Corpo..	0.02%
Silergy Corp.	-0.04%
eMemory Technology, Inc.	-0.05%
Novatek Microelectronics Corp.	-0.07%
United Microelectronics Corp.	-0.08%
Taiwan Semiconductor Manufact..	-0.66%

## Taiwan Semiconductors Top Over/Underweights: Value

Stock Name	Over/Underweight
United Microelectronics Corp.	0.11%
ASE Technology Holding Co., Ltd.	0.10%
Macronix International Co., Ltd.	0.09%
Novatek Microelectronics Corp.	0.06%
Silicon Motion Technology Corpo..	0.05%
Win Semiconductors Corp.	-0.03%
Parade Technologies, Ltd.	-0.03%
Silergy Corp.	-0.07%
MediaTek Inc	-0.24%
Taiwan Semiconductor Manufact..	-2.31%

## Taiwan Semiconductors Top Over/Underweights: Yield

Stock Name	Over/Underweight
Novatek Microelectronics Corp.	0.30%
Chipbond Technology Corporation	0.22%
ASE Technology Holding Co., Ltd.	0.13%
Vanguard International Semicon..	0.08%
Nanya Technology Corporation	0.08%
Silergy Corp.	-0.04%
MediaTek Inc	-0.05%
eMemory Technology, Inc.	-0.05%
United Microelectronics Corp.	-0.21%
Taiwan Semiconductor Manufact..	-0.77%

# Taiwan Semiconductors

# Aggregate Gap Analysis

Ch1. The blue line shows the total number of funds (out of 267) who have ever owned Taiwan Semiconductors stocks. The green area shows the number of funds invested at any one time and the red line the difference. A downward sloping red line means existing investors are closing out positions, a rising red line means previous investors are buying back in.

Ch. 1. Taiwan Semiconductors: Current Number of Funds Invested, Total Number of Funds Invested, Gap

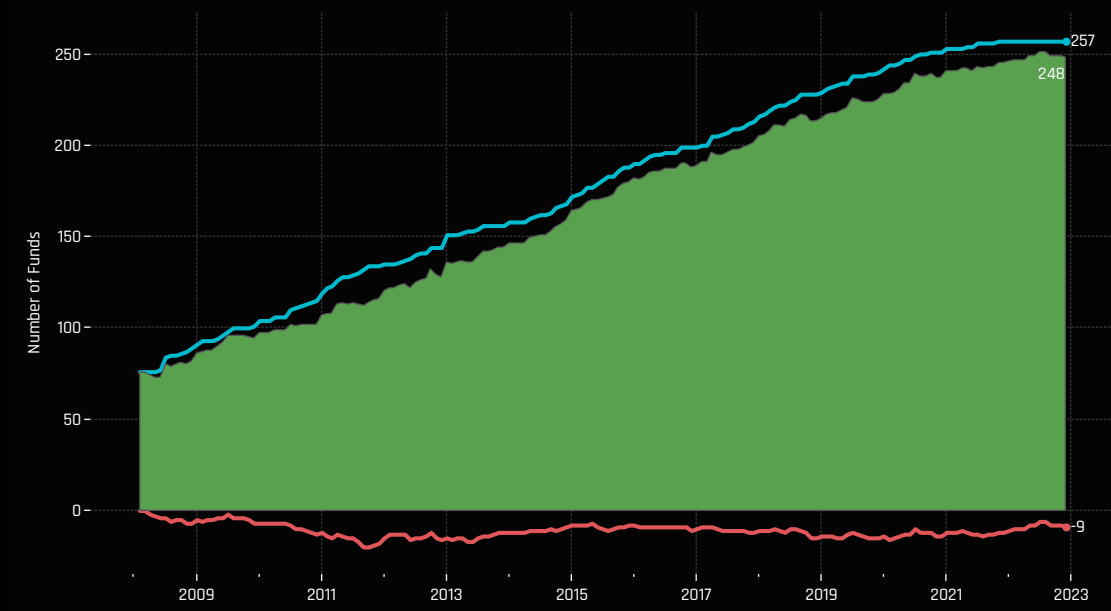


Chart 2: The orange lines show the current AUM in Taiwan Semiconductors stocks for each fund. The red lines show the gap between today's weight and the maximum weight for each fund.

Ch2. Taiwan Semiconductors: Current AUM \$ vs Gap to Max \$

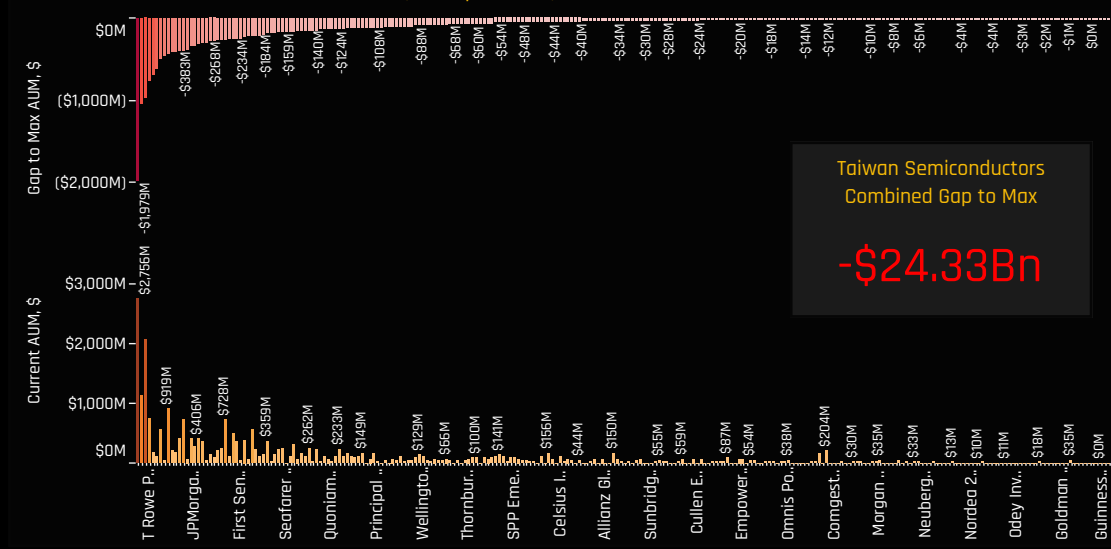


Chart 3: The Z-Score of current weights versus history for all current and previous holders of Taiwan Semiconductors stocks. A value of 100% means today's weight is the highest on record for that fund, zero the lowest.

Ch. 3: Taiwan Semiconductors: Portfolio Weight Z-Score

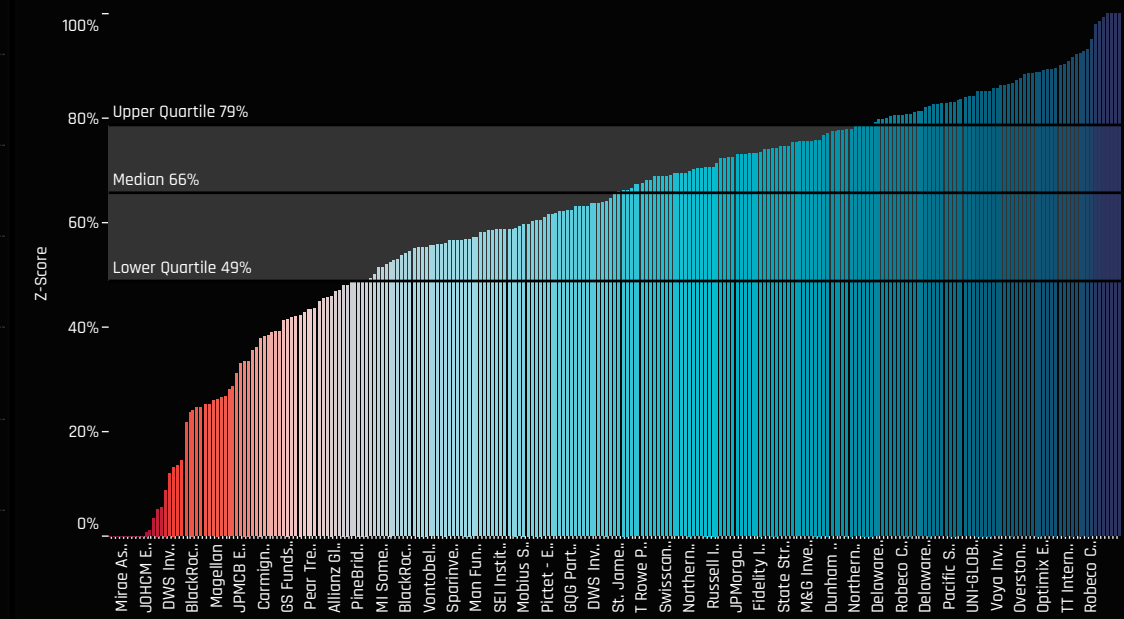


Chart 4: Blue lines show the current weight in Taiwan Semiconductors stocks for each fund. The red lines show the gap between today's weight and the maximum weight for each fund.

Ch4. Taiwan Semiconductors: Current Weights % vs Gap to Max %

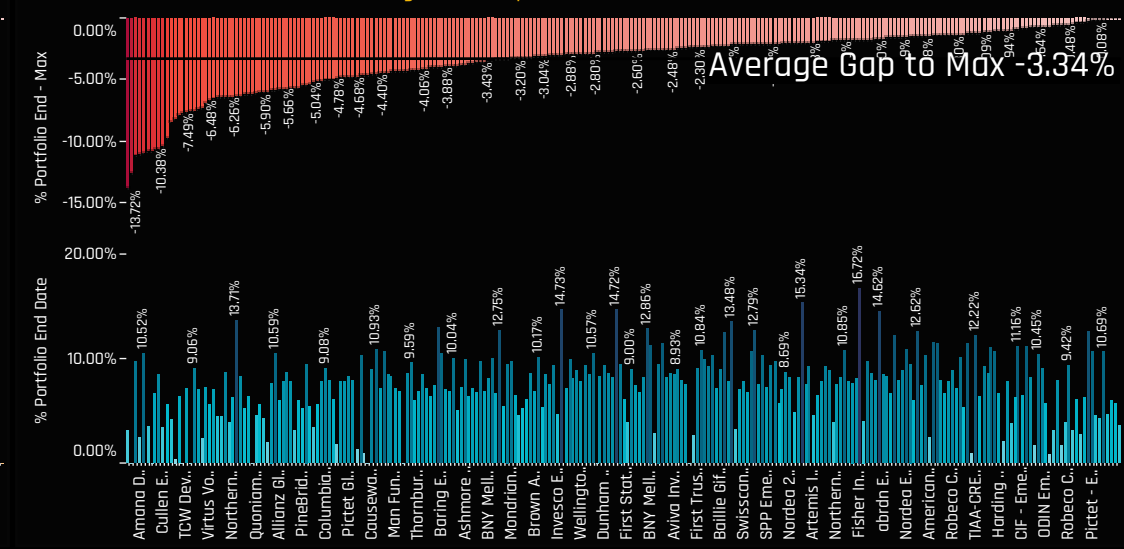


Chart 1: Current fund weight, maximum fund weight and difference for Taiwan Semiconductors stocks.  
 Chart 2: Current fund AUM, maximum fund AUM and \$ difference for Taiwan Semiconductors stocks

Chart 3: Current fund weight, maximum fund weight and Z-Score for Taiwan Semiconductors stocks, ranked by Z-Score  
 Chart 4: Current fund AUM, maximum AUM and Z-Score for Taiwan Semiconductors stocks, ranked by Z-Score.

### Ch. 1: Taiwan Semiconductors: Largest Gap to Max (%)

Fund Name	Latest Weight	Max Weight	Difference
Amonis Equity Emerging Markets	3.12%	16.84%	-13.72%
PGIM Jennison Emerging Markets Equity Opportunities Fund	0.00%	12.52%	-12.52%
Putnam Emerging Markets Equity Fund	9.69%	20.83%	-11.14%
Amana Developing World Fund	2.45%	13.46%	-11.01%
JPMCB Emerging Markets Equity Focused Fund	10.52%	21.37%	-10.85%
Liontrust Investment Funds II - Emerging Markets Fund	3.56%	14.37%	-10.81%
Skyline Umb. Fd. ICAV - ARGA Emerging Market Equity Fund	0.00%	10.73%	-10.73%
Wellington Mgmt. Funds (IE) Plc - EM Opportunities Fund	6.61%	17.22%	-10.60%
William Blair Emerging Markets Growth Fund	8.47%	19.01%	-10.54%
Cullen Emerging Markets High Dividend Fund	3.35%	13.73%	-10.38%
Harbor Emerging Markets Equity Fund	5.66%	15.28%	-9.63%
Alger Funds II - Emerging Markets Fund	4.22%	12.57%	-8.35%
JOHCM Emerging Markets Opportunities Fund	0.38%	8.50%	-8.12%
Pear Tree Axiom Emerging Markets World Equity Fund	6.32%	14.11%	-7.79%
Eastspring Investments - Global Emerging Markets Dynamic Fu.	0.00%	7.67%	-7.67%
TCW Developing Markets Equity Fund	7.15%	14.73%	-7.59%
Pictet Global Selection Fund - Global Growing Market	0.00%	7.49%	-7.49%
Principal Origin Emerging Markets Fund	9.06%	16.51%	-7.45%
Virtus Emerging Markets Opportunities Fund	7.00%	14.32%	-7.32%
Polunin Funds - Developing Countries	2.34%	9.56%	-7.22%

### Ch. 3: Taiwan Semiconductors: Highest Ownership Z-Score (%)

Fund Name	Latest Weight	Max Weight	Z-Score
Sunbridge Capital Emerging Markets Fund	3.70%	3.70%	100.00%
LSV Emerging Markets Equity Fund	5.77%	5.77%	100.00%
Baron Emerging Markets Fund	6.03%	6.03%	100.00%
AMG GW&K Emerging Wealth Equity Fund	4.62%	4.62%	100.00%
SEB Emerging Marketsfond	10.69%	10.77%	99.24%
Vontobel Fund - mtx Sustainable Emerging Markets Leaders	12.64%	12.83%	98.32%
Pictet - Emerging Markets Sustainable Equities	10.61%	10.76%	97.85%
Robeco Capital Gr. Fds. - Emerging Stars Equities	9.42%	9.92%	94.95%
TT International Funds Plc - Emerging Markets Unconstrained	11.14%	11.94%	93.36%
Calvert Emerging Markets Equity Fund	10.45%	11.09%	92.70%
Fidelity Inv. Trust - Emerging Markets Fund	11.16%	12.03%	92.42%
USAA Emerging Markets Fund	7.97%	8.55%	92.31%
Lazard Emerging Markets Equity Portfolio	6.08%	6.46%	91.81%
TT International Funds Plc - Emerging Markets Equity Fund	10.65%	11.67%	90.81%
TIAA-CREF Emerging Markets Equity Fund	12.22%	13.43%	90.36%
DDIN Emerging Markets	5.76%	6.39%	90.15%
JPMorgan Emerging Markets Equity Fund	11.02%	12.07%	89.64%
White Fleet - OLZ Equity Emerging Market Optimized ESG	2.72%	3.04%	89.43%
AB FCP I - Emerging Markets Growth Portfolio	11.62%	13.00%	89.42%
Optimix Emerging Markets Fund	7.75%	8.70%	89.00%

### Ch. 2: Taiwan Semiconductors: Largest Gap to Max (\$)

Fund Name	Latest AUM, \$	Max AUM, \$	Difference
Invesco Developing Markets Fund	\$2,756M	\$4,735M	-\$1,979M
American Funds New World Fund	\$1,143M	\$2,189M	-\$1,046M
Fidelity Inv. Trust - Emerging Markets Opportunities Fund	\$2,070M	\$3,035M	-\$965M
T Rowe Price Emerging Markets Stock Fund	\$749M	\$1,504M	-\$755M
Lazard Emerging Markets Equity Portfolio	\$175M	\$875M	-\$701M
Virtus Vontobel Emerging Markets Opportunities Fund	\$113M	\$719M	-\$605M
Vontobel Fund - mtx Sustainable Emerging Markets Leaders	\$581M	\$1,069M	-\$488M
Magellan	\$47M	\$509M	-\$462M
JPMorgan Emerging Markets Equity Fund	\$919M	\$1,343M	-\$424M
Principal Origin Emerging Markets Fund	\$204M	\$623M	-\$419M
JPMCB Emerging Markets Equity Focused Fund	\$185M	\$602M	-\$417M
Nordea 1 - Emerging Stars Equity Fund	\$404M	\$800M	-\$395M
Delaware Emerging Markets Fund	\$731M	\$1,123M	-\$392M
Comgest Growth Plc - Emerging Markets	\$57M	\$440M	-\$383M
Schroder ISF - Emerging Markets	\$409M	\$745M	-\$335M
JPMorgan Funds - Emerging Markets Opportunities Fund	\$283M	\$612M	-\$329M
Federated Hermes Inv. Funds - Global Emerging Markets Equit.	\$406M	\$725M	-\$319M
GS Funds - Emerging Markets Equity Portfolio	\$355M	\$656M	-\$301M
Pictet Global Selection Fund - Global High Yield Emerg. Eq.	\$56M	\$352M	-\$296M
Causeway Emerging Markets Fund	\$130M	\$409M	-\$279M

### Ch. 4: Taiwan Semiconductors: Highest Ownership Z-Score (\$)

Fund Name	Latest AUM, \$	Max AUM, \$	Z-Score
LSV Emerging Markets Equity Fund	\$1M	\$1M	100.00%
Guinness Asset Mgmt. Fund Plc - Emerging Markets Equity Inc.	\$0M	\$0M	98.07%
Lazard Glb. Active Fds. Plc - Emerging Markets Eq. Adv. Fd.	\$35M	\$37M	96.40%
Aviva Invs. - Global Emerging Markets Equity Unconstrained Fd.	\$11M	\$12M	95.26%
TIAA-CREF Emerging Markets Equity Fund	\$204M	\$215M	94.42%
Fidelity SAI Emerging Markets Value Index Fund	\$168M	\$180M	91.88%
Advisors Series Tr. - Pzena Emerging Markets Value Fund	\$18M	\$20M	89.00%
USAA Emerging Markets Fund	\$51M	\$58M	84.62%
RBC Funds (Lux) - Emerging Markets Value Equity Fund	\$9M	\$10M	83.65%
HSBC GIF - Global Emerging Markets Equity	\$33M	\$40M	81.72%
White Fleet - OLZ Equity Emerging Market Optimized ESG	\$1M	\$2M	80.58%
Robeco Capital Gr. Fds. - QI EM Sustainable Enhanced Index Eq.	\$15M	\$20M	80.39%
Robeco Capital Gr. Fds. - Emerging Stars Equities	\$150M	\$185M	79.91%
T Rowe Price Emerging Markets Discovery Stock Fund	\$87M	\$109M	79.89%
Polar Capital Funds Plc - Emerging Market Stars Fund	\$156M	\$201M	77.51%
AMG GW&K Emerging Wealth Equity Fund	\$4M	\$5M	77.21%
Morgan Stanley Pathway Emerging Markets Equity Fund	\$35M	\$44M	76.53%
Raiffeisen Sustainable Emerging Markets Equities	\$32M	\$41M	76.34%
Goldman Sachs ESG Emerging Markets Equity Fund	\$5M	\$6M	75.55%
DDIN Emerging Markets	\$11M	\$15M	75.28%



# Taiwan Semiconductors

Chart 1: Current fund weight, maximum fund weight and the difference for Taiwan Semiconductors stocks. Filtered for funds that have bought in to Taiwan Semiconductors between 11/30/2021 - 11/30/2022

Chart 2: Current fund AUM, maximum fund AUM and the USD difference for Taiwan Semiconductors stocks. Filtered for funds that have bought in to Taiwan Semiconductors between 11/30/2021 - 11/30/2022

Ch. 1: Taiwan Semiconductors: Largest Gap to Max (%) and Buying between 11/30/2021 - 11/30/2022

Fund Name	Latest Weight	Max Weight	Difference	Fund Flows, \$
JDHDM Emerging Markets Opportunities Fund	0.38%	8.50%	-8.12%	\$0M
Carmignac Emergents	3.96%	10.35%	-6.40%	\$47M
Morgan Stanley Instl. Fund - Emerging Markets Leaders Port.	5.58%	11.55%	-5.97%	\$6M
Wasatch Emerging Markets Select Fund	7.71%	13.52%	-5.81%	\$36M
Allianz Global Investors Fund - GEM Equity High Dividend	8.71%	14.38%	-5.67%	\$2M
Ashmore Emerging Markets Active Equity Fund	9.55%	14.97%	-5.41%	\$2M
Celsius Invst. Fd. SICAV - Sustainable Em. Markets	10.26%	14.94%	-4.68%	\$19M
UBS Investment Funds ICVC - Global Emerging Markets Equity	12.99%	16.91%	-3.93%	\$43M
Threadneedle Specialist Invst. Fds.-Global Emerging Markets	10.04%	13.92%	-3.88%	\$8M
KBC Equity Fund - SRI Emerging Markets	7.27%	11.04%	-3.78%	\$9M
Ashmore Emerging Markets Equity Fund	9.85%	13.58%	-3.72%	\$2M
BNY Mellon Investment Fds. - Emerging Income Fund	8.07%	11.49%	-3.43%	\$3M
JPMorgan Funds - Emerging Markets Sustainable Equity Fund	12.75%	16.06%	-3.32%	\$22M
GQG Partners Emerging Markets Equity Fund	5.49%	8.80%	-3.31%	\$87M
Empower Emerging Markets Equity Fund	9.45%	12.75%	-3.30%	\$24M
Mondrian Emerging Markets Value Equity Fund	9.75%	12.97%	-3.22%	\$0M
Schroder ISF - Emerging Markets Equity Alpha	10.17%	13.26%	-3.09%	\$3M
Robeco Institutional Emerging Markets Fund	8.46%	11.28%	-2.82%	\$5M
Fidelity Funds SICAV - Sust. Emerging Markets Equity Fund	10.57%	13.38%	-2.81%	\$31M
Schroder ISF - Global Emerging Market Opportunities	8.37%	11.11%	-2.74%	\$21M

Ch. 2: Taiwan Semiconductors: Largest Gap to Max (\$) and Buying between 11/30/2021 - 11/30/2022

Fund Name	Latest AUM, \$	Max AUM, \$	Difference	Fund Flows, \$
Fidelity Inv. Trust - Emerging Markets Opportunities Fund	\$2,070M	\$3,035M	-\$965M	\$184M
Lazard Emerging Markets Equity Portfolio	\$175M	\$875M	-\$701M	\$74M
JPMorgan Emerging Markets Equity Fund	\$919M	\$1,343M	-\$424M	\$262M
Federated Hermes Invst. Funds - Global Emerging Markets Equit.	\$406M	\$725M	-\$319M	\$28M
Fidelity Inv. Trust - Emerging Markets Fund	\$728M	\$984M	-\$256M	\$41M
First Sentier Investors ICVC - Stewart Inv. Glb. EM Leaders	\$40M	\$282M	-\$241M	\$56M
GQG Partners Emerging Markets Equity Fund	\$559M	\$773M	-\$214M	\$87M
Goldman Sachs Emerging Markets Equity Fund	\$359M	\$543M	-\$184M	\$20M
CIF - Emerging Markets Growth Fund (LUX)	\$23M	\$205M	-\$182M	\$10M
John Hancock Emerging Markets Equity Fund	\$221M	\$391M	-\$170M	\$19M
Calvert Emerging Markets Equity Fund	\$260M	\$421M	-\$161M	\$14M
M&G Investment Funds (7) OEIC - Global Emerging Markets Fun.	\$32M	\$172M	-\$140M	\$21M
Robeco Institutional Emerging Markets Fund	\$66M	\$201M	-\$135M	\$5M
BlackRock Global Funds - Emerging Markets Fund	\$166M	\$289M	-\$123M	\$1M
Nordea Emerging Market Equities	\$89M	\$210M	-\$121M	\$10M
Carmignac Emergents	\$34M	\$134M	-\$100M	\$47M
Schroder ISF - Global Emerging Market Opportunities	\$129M	\$218M	-\$90M	\$21M
Amundi Funds - Emerging World Equity	\$73M	\$157M	-\$84M	\$1M
First State Investments ICVC - Global Emerging Markets Fd.	\$3M	\$73M	-\$71M	\$4M
Fisher Invts. Instl. Fds. Plc - Emerging Markets Eq. ESG Fund	\$100M	\$163M	-\$63M	\$5M

# Flow Potential

Chart 3: Current fund weight, maximum fund weight and Z-Score for Taiwan Semiconductors stocks, ranked by Z-Score. Filtered for funds that have sold Taiwan Semiconductors between 11/30/2021 - 11/30/2022 and have a % Z-Score of above 50%.

Chart 4: Current fund AUM, maximum AUM and Z-Score for Taiwan Semiconductors stocks, ranked by Z-Score. Filtered for funds that have sold Taiwan Semiconductors between 11/30/2021 - 11/30/2022 and have a \$ Z-Score of above 50%.

Ch. 3: Taiwan Semiconductors: Z-Score (%) > 50% and selling between 11/30/2021 - 11/30/2022

Fund Name	Latest Weight	Max Weight	Z-Score	Fund Flows, \$
Baron Emerging Markets Fund	6.03%	6.03%	100.00%	(\$39M)
Vontobel Fund - mtx Sustainable Emerging Markets Leaders	12.64%	12.83%	98.32%	(\$88M)
TT International Funds Plc - Emerging Markets Equity Fund	10.65%	11.67%	90.81%	(\$18M)
Odey Investments Plc - Brook Global Emerging Markets Fund	4.30%	4.39%	88.78%	\$0M
Templeton Developing Markets Trust	15.34%	17.30%	88.62%	(\$17M)
Overstone Fund PLC - Emerging Markets Equity Fund	4.57%	4.68%	87.45%	(\$3M)
Invesco Developing Markets Fund	10.09%	11.40%	86.85%	(\$610M)
Fisher Invts. Instl. Fds. Plc - Emerging Markets Equity Fund	14.62%	16.28%	86.23%	(\$85M)
Baillie Gifford Overseas Growth Funds ICVC - EM. Growth	11.44%	12.81%	86.15%	(\$35M)
KBI Funds ICAV - Emerging Markets Equity Fund	9.18%	10.33%	83.47%	\$1M
Pacific Select Fund - Emerging Markets Portfolio	9.75%	11.46%	83.08%	(\$38M)
Fidelity Institutional Funds - Emerging Markets Fund	12.86%	15.43%	82.85%	(\$39M)
Harding Loevner Institutional Emerging Markets Portfolio	6.65%	7.68%	82.73%	(\$97M)
CT (Lux) III - Responsible Global Emerging Markets Equity	10.84%	13.14%	82.50%	(\$3M)
Virtus NFJ Emerging Markets Value Fund	9.69%	11.77%	82.33%	\$0M
Janus Henderson Emerging Markets Fund	8.69%	10.69%	81.26%	(\$3M)
GS Funds - Emerging Markets Equity Portfolio	10.85%	12.65%	81.21%	(\$55M)
Nordea 1 - Emerging Stars Equity Fund	13.48%	15.62%	80.98%	(\$112M)
SEI Institutional Intl. Trust - Emerging Markets Equity Fund	7.87%	9.39%	80.25%	(\$2M)
Hirtle Callaghan Emerging Markets Portfolio	6.62%	7.97%	79.97%	(\$6M)

Ch. 4: Taiwan Semiconductors: Z-Score (\$) > 50% and selling between 11/30/2021 - 11/30/2022

Fund Name	Latest AUM, \$	Max AUM, \$	Z-Score	Fund Flows, \$
Baron Emerging Markets Fund	\$321M	\$478M	67.22%	(\$39M)
MFS Emerging Markets Equity Fund	\$498M	\$741M	66.63%	(\$18M)
SEI Institutional Intl. Trust - Emerging Markets Equity Fund	\$117M	\$175M	64.41%	(\$2M)
SA Emerging Markets Value Fund	\$3M	\$5M	63.54%	\$0M
Candriam Sustainable - Equity Emerging Market	\$233M	\$359M	63.33%	(\$17M)
TT International Funds Plc - Emerging Markets Equity Fund	\$63M	\$100M	63.20%	(\$18M)
BlackRock Emerging Markets Fund Inc.	\$262M	\$414M	63.03%	(\$27M)
Fidelity Institutional Funds - Emerging Markets Fund	\$382M	\$615M	61.91%	(\$39M)
Baillie Gifford Overseas Growth Fund - Emer. Mkts. Leading Co.	\$98M	\$158M	60.52%	(\$19M)
JPMorgan Trust IV - Emerging Markets Research Enhanced Eq.	\$232M	\$375M	60.48%	(\$10M)
SPP Emerging Markets Plus	\$85M	\$135M	60.25%	(\$10M)
Sanford C Bernstein Fund - Emerging Markets Portfolio	\$107M	\$162M	60.08%	(\$1M)
Templeton Developing Markets Trust	\$161M	\$273M	58.84%	(\$17M)
Wellington Mgmt. Fds. (LU) - EM Research Equity Fund	\$123M	\$211M	58.45%	(\$4M)
MFS Blended Research Emerging Markets Equity Fund	\$4M	\$6M	58.07%	(\$1M)
JPMorgan Fund ICVC - Emerging Markets Income Fund	\$78M	\$136M	57.09%	(\$2M)
Allspring Emerging Markets Equity Fund	\$360M	\$602M	56.86%	(\$85M)
SEI Institutional Invst. Trust - Emerging Markets Equity Fund	\$63M	\$107M	56.66%	(\$7M)
Old Mut. MultiManager Tr.-Quil. Invtrs. Em. Mrkts. Eq. In. Fd.	\$13M	\$21M	55.47%	(\$1M)
Invesco Developing Markets Fund	\$2,756M	\$4,735M	55.46%	(\$610M)

## Style Classifications

Each fund is split into a Style category based on the P/E and P/B ratios of their portfolio compared to the benchmark

**Aggressive Growth:** At least 70% of the portfolio in stocks with a higher P/E than the iShares MSCI Emerging Markets ETF average, and at least 70% with a higher P/B ratio.

**Growth:** At least 50% of the portfolio in stocks with a higher P/E than the iShares MSCI Emerging Markets ETF average, and at least 50% with a higher P/B ratio.

**Value:** Either by the fund description, or at least 50% of the portfolio in stocks with a lower P/E ratio than the iShares MSCI Emerging Markets ETF average, and at least 50% with a lower P/B ratio

**Yield:** As per the fund description only (i.e Yield, Dividend, Income funds).

**GARP:** All other iterations that do not fit under the above classifications.

## Ownership Calculations

We track GEM Fund ownership across sectors, industries and stocks using a variety of calculations. They are listed below:

**Average Weight:** The sum of all fund weights in any measure (region, country, sector, industry, stock) divided by the total number of funds (267) in the analysis.

**Average Weight vs EEM:** The average weight minus the weight in the iShares MSCI Emerging Markets ETF (cash removed and weights adjusted).

**Funds Invested %:** The total number of funds with any exposure to a measure divided by the total number of funds (267) in the analysis.

**Funds O/W:** The total number of funds overweight a measure versus the EEM, divided by the total number of funds (267) in the analysis.

**AUM, \$:** The combined AUM allocated to a particular measure across the 267 active GEM funds in our analysis, in US Dollars

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