

US Stock Express

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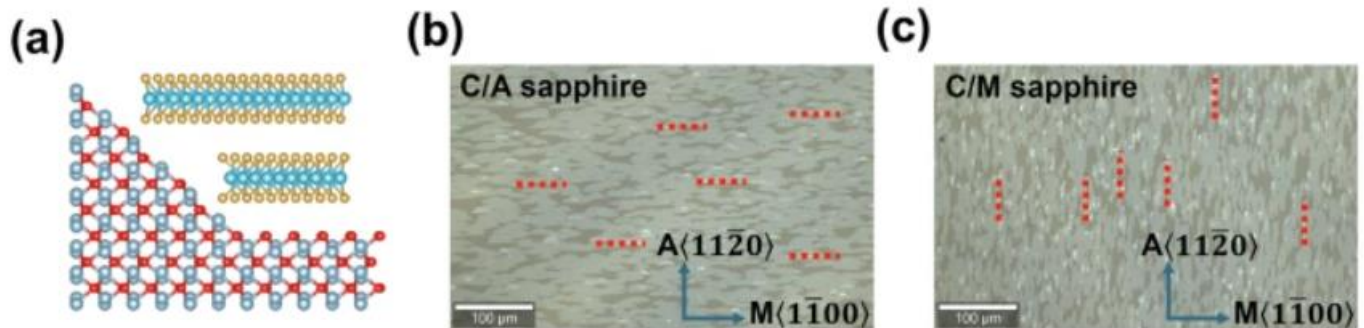


Importance of the NTU-TSMC Collaboration on 2D WSe₂ Materials

This cooperation between National Taiwan University (NTU) and Taiwan Semiconductor Manufacturing Company (TSMC) is highly important—a genuine milestone in semiconductor research that could help sustain progress beyond the traditional limits of silicon-based chips.

From GROK of X.AI

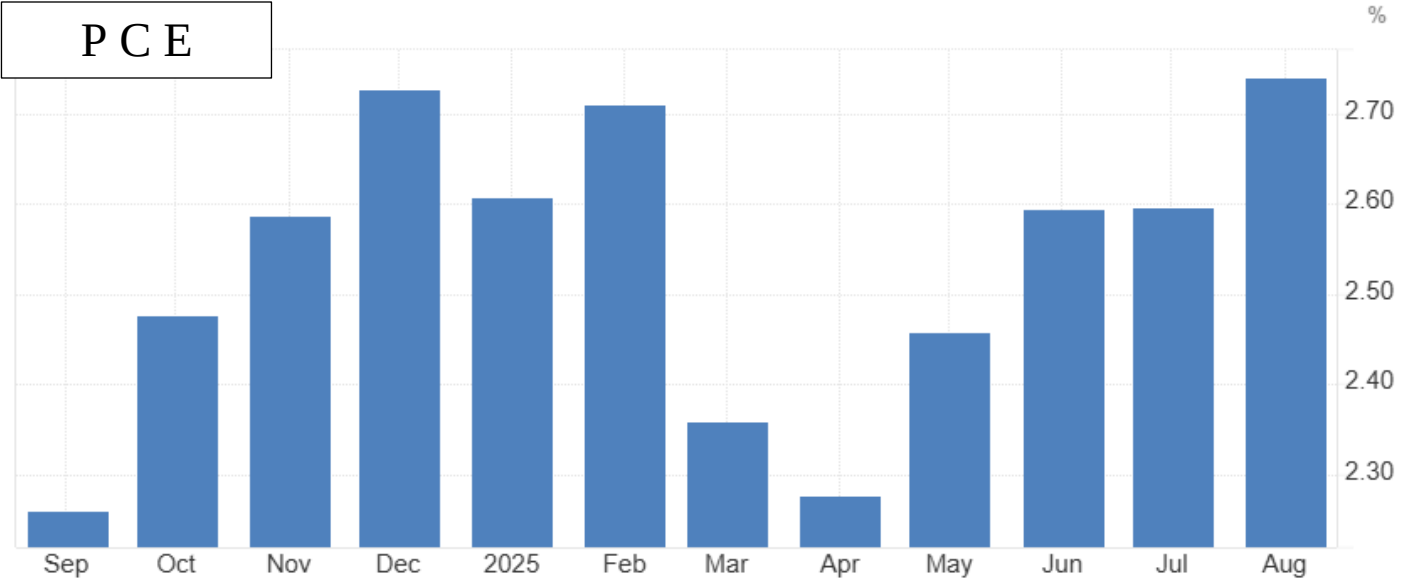
Fig. 2: Bilayer WSe₂ grown by AACVD method.



This collaboration between National Taiwan University (NTU) and Taiwan Semiconductor Manufacturing Company (TSMC) is a highly significant milestone in semiconductor research, especially in the context of Moore's Law and the future of chip performance.

From Copilot of Microsoft
LLOIJ / OBITOI OT IATCLO2011

Refer to page 4-8 please.



Mind that since the Liberation Day of April, it grew sharply, don't say the effect of tariff will just come out by the end of this year.

Calendar	GMT	Reference	Actual	Previous	Consensus	TEForecast
2025-08-29	12:30 PM	Jul	2.6%	2.6%	2.6%	2.6%
2025-09-26	12:30 PM	Aug	2.7%	2.6%	2.7%	2.8%
2025-10-31	12:30 PM	Sep		2.7%		2.8%
Related			Last	Previous	Unit	Reference
Core PCE Price Index			126.71	126.42	points	Aug 2025
Core PCE Price Index YoY			2.91	2.85	percent	Aug 2025
Core PCE Price Index MoM			0.20	0.20	percent	Aug 2025
Core PCE Prices QoQ			2.60	3.30	percent	Jun 2025
GDP Price Index			127.58	126.45	points	Mar 2025
PCE Price Index			127.29	126.95	points	Aug 2025
PCE Price Index YoY			2.74	2.60	percent	Aug 2025
PCE Price Index MoM			0.30	0.20	percent	Aug 2025
PCE Prices QoQ			2.10	3.40	percent	Jun 2025

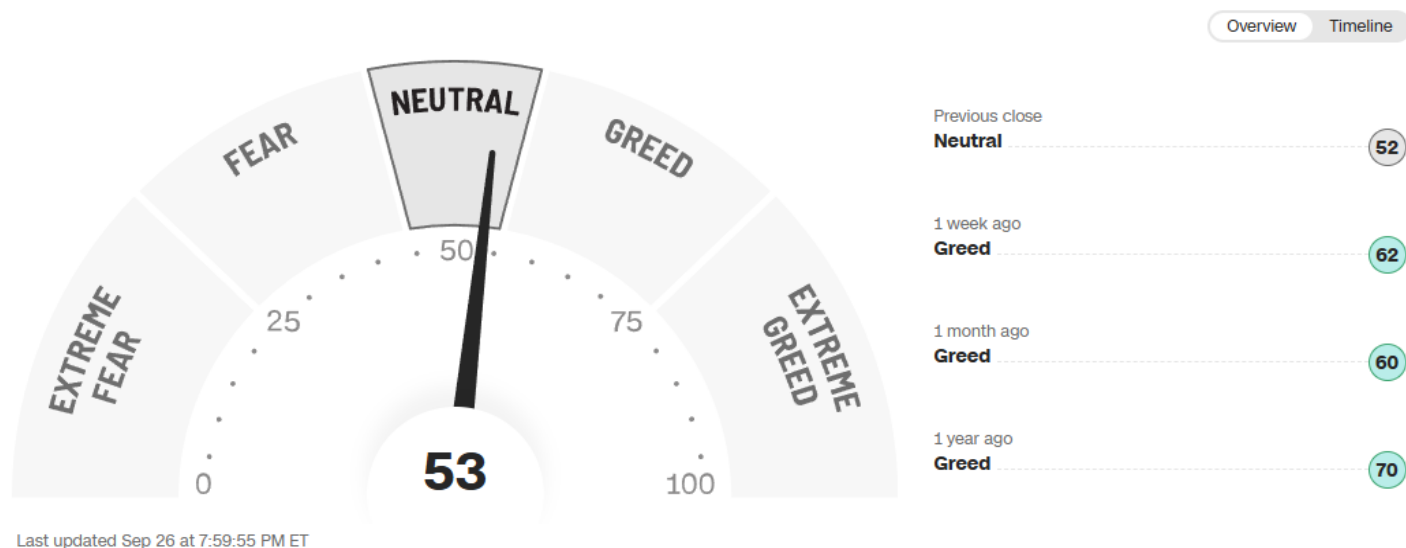
PCE prices in the US increased 2.7% year-on-year in August 2025, the highest in six months, compared to 2.6% in each of the previous two months. Figures came in line with market expectations. PCE Price Index Annual Change in the United States averaged 3.29 percent from 1960 until 2025, reaching an all time high of 11.60 percent in March of 1980 and a record low of -1.47 percent in July of 2009

*Risk disclosure: Price can go up and down at any moment, use free money to trade and bear the risk according to your own capital;
 Never trade with money that has a deadline for withdrawal.
 All suggestions are for reference only, even AI cannot be 100% reliable, final decision still lies upon investors.
 Copy trading cannot replicate another trader's background or psychological state.*

Fear & Greed Index

What emotion is driving the market now?

[Learn more about the index](#)



North East West South is NEWS

Trump said Chinese President Xi Jinping had agreed the deal of TikTok, but were complained as collusion of officials and business men as Trump he himself will be benefitted most.

European Union defense chiefs held talks with several eastern member states today, saying Europe needs to learn from Ukraine and quickly build a "Great Wall" to defend against drone invasions, sparked by a series of recent violations of European Union (EU) airspace.

After President Donald Trump announced that he would impose new high tariffs on drugs, the European Union said today that the trade deal reached between the EU and the United States would guarantee that exports of drugs from EU countries to the United States will not be subject to tariffs exceeding 15%.

India said it held "constructive talks" with the United States on a trade deal this week, but the U.S.'s stance to stop buying Russian oil put pressure on the talks.

Iranian President Masoud Pezeshkian said Washington had asked Tehran to hand over all enriched uranium in exchange for a three-month suspension of sanctions, which Iran had clearly rejected, stressing it was "unacceptable".



Why This NTU–TSMC Collaboration Matters

From Copilot of Microsoft
LLOIJ / CDDHOF OT JATICLOZOH

- **Breakthrough in 2D Materials:** The joint team successfully developed large-area, low-defect monolayer and bilayer tungsten diselenide (WSe₂), a p-type 2D semiconductor material. This is a major leap because p-type materials have lagged behind n-type ones like MoS₂ in scalability and performance 國立臺灣大學.
- **Enhanced Mobility:** Bilayer WSe₂ transistors demonstrated higher carrier mobility and lower contact resistance, which are critical for high-performance, low-power electronics Nature.
- **Extending Moore’s Law:** As silicon-based transistors approach physical limits (e.g., short channel effects), 2D materials like WSe₂ offer a path to continue scaling beyond the 2-nm node, potentially keeping Moore’s Law alive Nature.



Moore’s Law and Future Chip Performance

Moore’s Law predicts that transistor density doubles roughly every two years, which often correlates with increased computing power. However, the real-world implications are more nuanced:

Time Frame	Transistor Density	Theoretical Computing Power Increase
2 years	2×	~2×
4 years	4×	~4×
6 years	8×	~8× (not 16×)

- **Why Not 16× in 6 Years?:** Moore’s Law is exponential in transistor count, but computing power depends on multiple factors: architecture, power efficiency, thermal limits, and software optimization. So while transistor count may double every two years, computing power doesn’t always scale linearly.
- **Jensen Huang’s Statement:** When Nvidia’s CEO said computing power doubles every two years, he was likely referencing Moore’s Law as a guiding principle. But Nvidia also relies on architectural innovations, AI accelerators, and software stacks to achieve that growth.



Implications for TSMC Clients Like Nvidia

From Copilot of Microsoft
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- **TSMC's Role:** As the world's leading foundry, TSMC enables companies like Nvidia, Apple, AMD, and Qualcomm to push the limits of chip design.
- **Client Benefits:** If TSMC successfully integrates WSe₂ or other 2D materials into future nodes, clients could see significant gains in transistor density, energy efficiency, and performance.
- **Timeline Realism:** While breakthroughs like this are promising, commercialization takes time. It's unlikely that WSe₂ will be in mass production within 2 years, but it could shape the roadmap for 3–5 years ahead.



Final Thought

This NTU–TSMC research is not just a scientific achievement—it's a strategic move to future-proof semiconductor scaling. It's a bet on the post-silicon era, and if successful, it could redefine how chips are built and how fast they compute.

Sources: 國立臺灣大學 +1

You can read the full NTU announcement [here](#) and the Nature Communications article [here](#).

Would you like to explore how 2D materials compare to traditional silicon in terms of fabrication and performance?

Importance of the NTU-TSMC Collaboration on 2D WSe₂ Materials

This cooperation between National Taiwan University (NTU) and Taiwan Semiconductor Manufacturing Company (TSMC) is **highly important**—a genuine milestone in semiconductor research that could help sustain progress beyond the traditional limits of silicon-based chips. While not an immediate game-changer for commercial production (it's still in the R&D phase), it addresses core challenges in scaling transistors smaller than ~2nm, where silicon's "short-channel effects" (like leakage currents and loss of gate control) threaten efficiency and power use. The breakthrough—published in *Nature Communications* on **September 2025**—involves scalable growth of large-area, low-defect single- and bilayer tungsten diselenide (WSe₂), a 2D transition metal dichalcogenide (TMD) material, into high-performance p-type transistors. Key highlights from the paper:

- **Growth Innovation:** Using alkali-assisted chemical vapor deposition (AACVD) with KOH, the team **achieved uniform monolayer WSe₂ on 2-inch sapphire wafers and centimeter-scale bilayer films, with defect densities as low as $1.6\text{--}1.8 \times 10^{12} \text{ cm}^{-2}$ (comparable to lab-exfoliated flakes).**
- **Device Performance:** Bilayer WSe₂ transistors showed superior hole mobility ($119 \text{ cm}^2 \text{ V}^{-1} \text{ s}^{-1}$ vs. 105 for monolayer), lower contact resistance ($5.6 \text{ k}\Omega \cdot \mu\text{m}$ for holes), and a narrower bandgap (enabling better n/p-type balance). This improves electrostatic control, potentially slashing short-channel effects for sub-1nm channels.
- **Broader Implications:** 2D materials like WSe₂ (<1nm thick) promise "atomic-scale" transistors for monolithic 3D stacking and energy-efficient AI/compute, extending Moore's Law into the 2030s. TSMC's involvement (via joint development programs) signals industrial viability, as they're already scouting 2D integration for nodes beyond A16 (1.6nm).

In context, this fits TSMC's push for **"More than Moore"** innovations amid slowing transistor density gains (Moore's Law has decelerated to ~2.5 years per doubling since 2015). Collaborations like this—backed by Taiwan's National Science and Technology Council and NTU's AI-Mat center—bolster TSMC's edge in the \$600B+ global foundry market, where rivals like Intel/Samsung lag in 2D scaling.

Unimportant? Only if viewed short-term; long-term, it could cut chip power by 30-50% and boost density 2-4x, fueling AI and edge devices. Critics note scalability hurdles (e.g., yield on 300mm wafers), but this is a "proof-of-concept" win that de-risks billions in R&D.

From GROK of X.AI

Moore's Law and Future Computing Power in TSMC Chips

The quote you mentioned—"the number of transistors that can be accommodated in an integrated circuit doubles approximately every two years, while the cost remains relatively constant"—is the classic statement of **Moore's Law**, coined by Intel co-founder Gordon Moore in 1965 (updated from his original 18-month prediction). It drove ~40 years of exponential growth, but physics (quantum tunneling, heat dissipation) has slowed it: Transistor counts now double every ~2.5-3 years, and "effective" scaling (density + performance) relies on new materials like high-k dielectrics or, here, 2D TMDs.

- **2 Years Later (End-2027):** Not a clean double in raw computing power. TSMC's roadmap targets A16 (1.6nm-class, high-performance/low-power variants) in late 2026/early 2027, with ~15-20% density gain over N2 (2nm, volume 2025) and 10-15% speed/power improvements via nanosheet gates and backside power delivery. Overall chip compute (FLOPS) might rise 1.5-1.8x via node shrinks + architecture (e.g., chiplets), but not 2x—Moore's is more aspirational now.
- **4 Years Later (End-2029):** Closer to ~3x cumulative uplift. By then, TSMC eyes A14 (1.4nm) or early 2D-hybrid nodes, potentially integrating TMD channels for 20-25% density jumps. With AI optimizations, effective power could hit 3-4x today's (e.g., via stacked 3D logic), but costs rise (wafer prices up 10-20% per node).
- **6 Years Later (End-2031):** Around 5-8x, not 16x (that's a math slip— $2^3=8$ for three doublings). TSMC's 2030+ vision includes "angstrom-era" (sub-1nm) with 2D materials like WSe₂ for 30%+ efficiency gains, but full quadrupling per cycle is unlikely without breakthroughs in interconnects/photronics. Real-world: NVIDIA's H100 (2022) to Blackwell (2024) was ~4x in AI perf, blending process + design.

Moore's Law isn't "dead"—it's evolving into "More Moore" (denser chips) + "More than Moore" (3D, 2D integration). TSMC projects 20-30% annual cost-normalized performance gains through 2030, but doubling every 2 years is optimistic; expect 1.5-1.7x cycles amid rising R&D (\$30B+/year).

From GROK of X.AI

Jensen Huang's Statement and Implications for NVIDIA/TSMC Clients

Yes, NVIDIA CEO Jensen Huang's claim—GPU computing power doubling (or more) every 2 years—directly nods to Moore's Law but amps it up as **Huang's Law**: NVIDIA's GPUs have tripled performance biennially since 2000, outpacing pure transistor scaling via architecture (e.g., tensor cores, NVLink) and process nodes. In a January 2025 interview, Huang said AI chips are "outpacing Moore's Law" with 6-9 month doublings in effective compute (2010-2022 data), driven by demand for exaflop-scale AI.

If TSMC advances at this "speed" (guided by Moore's), clients like NVIDIA will **benefit significantly**, but with a lag:

- **2 Years (2027)**: NVIDIA's Rubin (R100) GPUs on TSMC's A16/N2P could see 2-3x perf over Blackwell (via denser cores + 2D trials), enabling \$1T+ data centers.
- **4 Years (2029)**: On A14 or 2D-augmented nodes, 4-6x uplift—Huang's Law thrives, as TSMC supplies 90%+ of NVIDIA's advanced silicon. Early 2D integration (post-2028 pilots) could add 20-30% efficiency, supercharging AI training.
- **Caveats**: Adoption of WSe₂/etc. is 5-7 years out (wafer-scale yields needed); NVIDIA diversifies (e.g., Samsung for some), but TSMC's monopoly on leading-edge means shared progress. Geopolitics (Taiwan risks) could disrupt, but this collab strengthens resilience.

In sum, this NTU-TSMC work is a vital bridge to post-silicon eras, modestly accelerating client roadmaps like NVIDIA's while reminding us: Exponential gains endure, but they're increasingly collaborative and multidisciplinary.

From GROK of X.AI

Conclusion : Hold at least one share of TSM for 5-7 years and see what happens.



World Observation

Day 1314
Russia/Ukraine Conflict

Riding the AI Waves

(28) Breakthrough of TSM

TSM has a breakthrough! How important or unimportant it is? Please refer to comments of GROK and COPILOT. When you have interest, you can enter into the Nature Communications to read the original academic essay.

[Large-scale alkali-assisted growth of monolayer and bilayer WSe₂ with a low defect density | Nature Communications](#)

If you have no interest can just read the underlined sentences on previous pages. When talking about semiconductor, please do not look down upon the power of Taiwan. Even India has 1.4 billion people and China has 1.3 billion, come to a total of 2.7 billion, still cannot produce a company like TSMC which is one of the Top 10 capitalization of the world. Taiwan only has 23 million population, less than one-tenth of them. It is really a miracle!

So how do we should view on this news? As said on page 5, some other companies are also benefitted which are NVDA, APPL, AMD and QCOM. Some people said that the chips of Huawei can replace NVDA, please refer to the comparison on Sep 23rd of The Express, and then now Jensen Huang said they can do more than Moore's Theory. That's what I said will tell later how far the gap is. Why they said so, it is because of the Deep Seek success in early 2025. The first week they were on the top of the most downloaded app of Apple Store. It is because Deep Seek used distilled method. They got a preference.

When submarine was invented, it was treated as an immoral weapon and should not be used in war or else will be blamed. For attacking others under water is a coward deed and should float up and let each other can attack and defense. It

started to use in World War I and widely used in World War II. But when everyone is wrong, it is correct. When everyone is immoral, it becomes a new rule of morality. So, everyone uses the distilled method of Deep Seek, they at once lose their preference. Such as owing a submarine cannot conquer the whole world now for others can also use and thus would not be considered as immoral.

The conclusion is that the semiconductor industry in Taiwan leads the world and matures in US by those IT giants. It is quite hard to be chased by others, even India said they join the competition in 2025. If others have no progress, the stars of tomorrow some day surely will chase up, but according to Moore's Law, the gap is wider and wider day by day. Now they even have a breakthrough to Moore's Law, so the chasing up will be harder and harder.

Of course, western people are very lazy in comparison with Asians. The 9-9-6 working system in China gave them surprise. That is working from 9:00am to 9:00pm daily, and 6 days a week. This is known as 9-9-6. But in Taiwan, TSMC is working on a 24-hour base in 3 shifts a day, 7 days a week, 365 days a year. Therefore, the gap is farther and farther as times go by.

Mind that the engineers of TSMC mainly come from 2 universities, that is the National Taiwan University and National Tsing Hua University. All the master candidates are marked by the TSMC one year before graduation. There are a lot of universities having a higher ranking than these 2 universities, but they still could not generate a TSMC which is on top 10 of the world. University rankings are quite important but not all in all. There is something rankings cannot show. These 2 universities are the backbone of Taiwan technology and semiconductor of the world. Please be noted that the National Tsing Hua University had no relation with the Tsing Hua University in Beijing, they are two different universities. Such as the Miami University had no relation with the University of Miami, they are 2 different universities, one is in Ohio and another in Miami.

When you go to Taiwan next time, do not forget to visit these 2 universities even though their rankings are not so high but they are unique. For trading strategies please refer to Market Observation on next page.



Market Observation

Curse of Sep Curse of Oct

PHLX
Semiconductor
6,305.05
+20.38 +(0.32%)

The curse of Sep had not come true, even saying the third week is of highest risk, but market still continue to break record high. It does not mean Statistic is non-believable. Statistic is still the most reliable and scientific method, but the hardest thing of analysis is to find out the exception. It does not mean AI is not reliable, they are still a strong and comprehensive analysts, but not a fortune teller. AI cannot tell you the exact time of collapse of the market and golden pit.

Basically, market now is still in uptrend even though slight adjustment had shown, but of course a lot of people are waiting for deeper correction so as to buy at low. Since the rate cut cycle started, after one year normally the S&P would rise. This is another statistic, but before we can find another new method, we have to believe in it or continue buying with your monthly income till June 21st, Summer Solstice of 2026. That is still 265 days to go.

But it does not mean it would not fall in this period, such as in 2025, the buying period is from March to August and really had a golden pit in April for more buying.

On Aug 26th, the Microsoft AI said MSTR would rise 573.85% in Sep, now it dropped from \$338 to \$309. AI is not 100% accurate, but we should keep silent on minors and focus on the majors. For the invest in the group of MSTR, COIN or CRCL should only occupy 5% of your total investment, and we still have at least 2 other choices. If you believe in Bitcoin can rise to \$150K or \$200K, still can hold it and buy it, they have already said the velocity is quite high.

Since Warren Buffet has sold out all his BYDDY, so investors better follow him, for he has no more in hand. The collapse is not limited to the business of that single company BYDDY, may lead to the whole e-car industry. Please be noted that in 2024 even Buffet has sold AAPL, but not all. AAPL still occupies 26% and still has 280 million shares, making up about 26% of its portfolio. However, it has already gone down 67% shares from the peak.

TSLA will launch out the Full Self Driving (FSD) version 14.0 this week, and 2 weeks later 14.1 and then 2 weeks later 14.2. Expected by year end will launch out version 15.0 which is 10 times safer than human driving and cost much lower. In mid-2026, will have mass production for commercial usage. By 2030, FSD drivers in US will be more than traditional drivers, by 2040 all traditional drivers will be faded out. Other competitors, no matter in domestic market or overseas market are hard to chase on its safety and low cost because of mass production. Optimus humanoid robot will come to commercial market in 2026. From 2030 to 2035, it will become a common household electric appliance in most families of US, such as washing machine and refrigerator, every family will possess one humanoid robot. Therefore, house helpers from South East Asia and Latin America, drivers from 5 continents, please get ready to lose your job. Final countdown already started!!!!!!

Everyone knows that Elon Musk has a special pay and performance scheme by TSLA, it is an extremely hard task. A lot of people are still having confidence in Elon Musk and consider him as a superman. People are now betting, who will be the largest companies after 20 years, NVDA or TSLA? Who will be the Alexander the Great of business? The difference is that Jensen Huang is the CEO of one company which is NVDA, Elon Musk has 7 companies and no intention to combine into one. So, Jensen is in a better position.

Anyway, forget this now, what investor should learn is from Warren Buffet who can earn 3890% in BYDDY, and not 10% or 20% in day trade and then cut loss or bounded for years. This is more important than curse of September or October for people are saying in the past 100 years, great stock crash will occur in October, as in 1929, 1987, 1997. But only 3 times, while the other 97 years are alright.

For analysis, please try to get some method to fill the blind point of AI, that is Financial Astrology which can find out the exceptions. Finally, please accept these beautiful adjectives, people said TSM, AVGO, ORCL, INTL or GOOG..... will be the next NVDA. Don't treat it as a plan, progress or forecast, just words that can make their shareholders happy and that's all.

So, on the edge of World War III, let's wide open our eyes and see how the 3 major indexes continue to break record high. It's the myth of Wall Street!