

AGENDA

Taiwan Economy Analysis

Key factors affecting GDP growth

Effect of semiconductor industry especially TSMC on Taiwan gdp

International economy effects on Taiwan gdp

1

Artush Habetyan

2

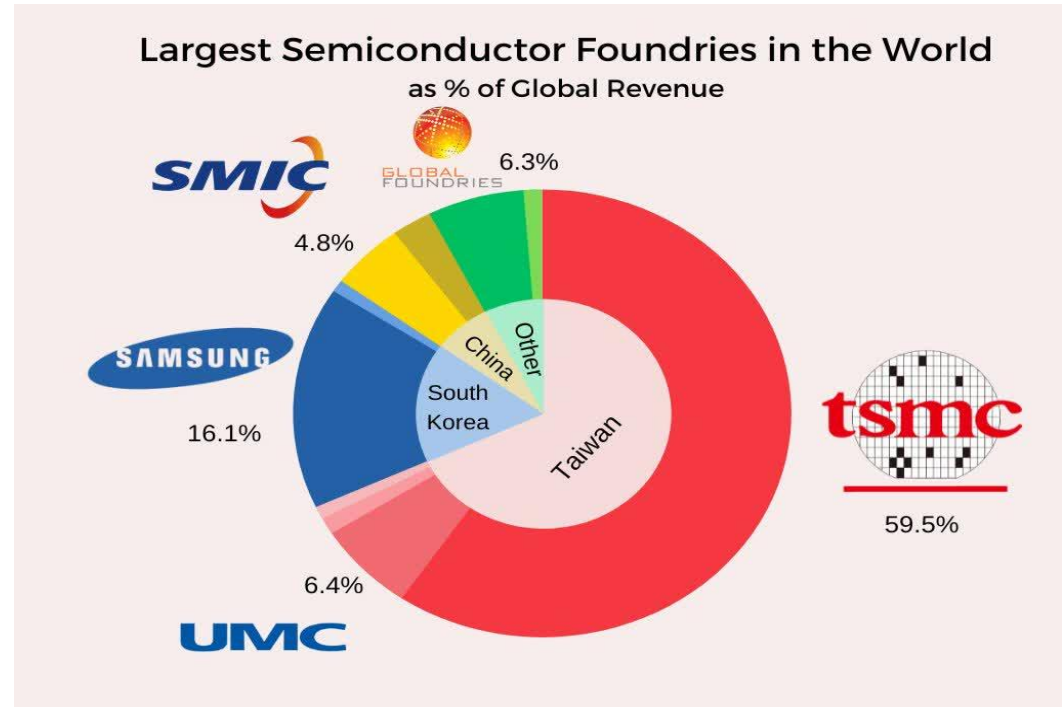
Khachatur Inants

3

Hrant Baloyan

Taiwan has the largest semiconductor production in the world, that's why we are interested to explore its economic priorities

We used market capitalization of TSMC, to explore how the largest semiconductor industry can impact its countries economy.



Taiwan GDP growth analysis

Taiwan GDP: Growth Dynamics

- Taiwan GDP is a key indicator of economic performance.
- Multiple models analyze Taiwan GDP growth dynamics.
- Stock market movements lead to policy adjustments.
- Long-run GDP relationships exist with market indicators.
- Taiwan economy shows rapid adjustment to equilibrium.



VAR model features

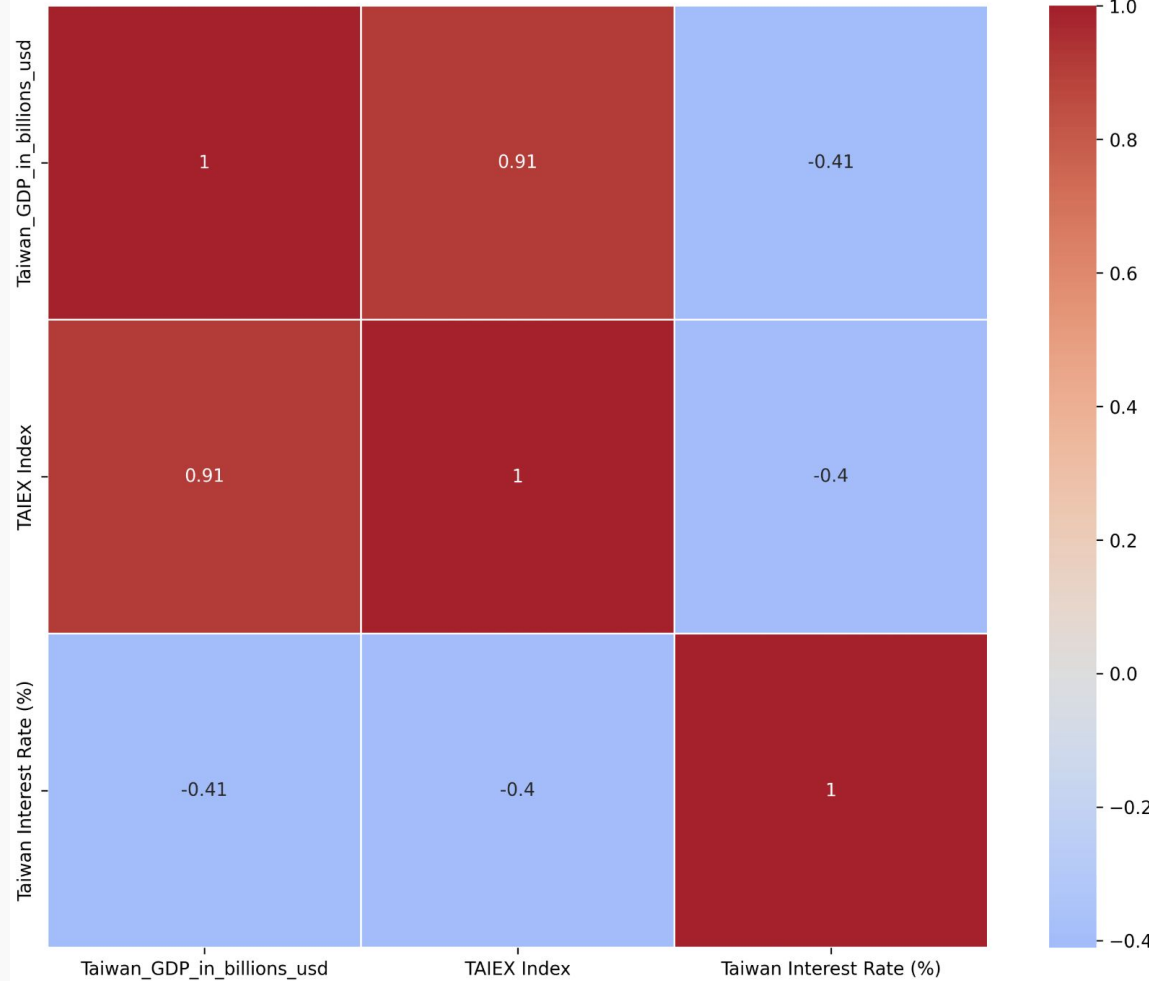
TWD/USD Exchange Rate, US Interest Rate (%), US GDP Growth (%), S&P 500 Index (LAG 0)

Taiwan_GDP, TAIEX Index, Taiwan Interest Rate (%), Taiwan-China Trade (USD Billions) (LAG 1)

Taiwan_GDP, TAIEX Index, Taiwan Interest Rate (%) (LAG 2)

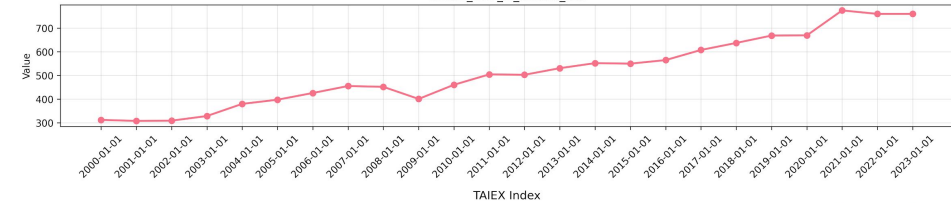
Endogenous: Taiwan Interest Rate (%), TAIEX Index_diff, Taiwan_GDP_in_billions_usd_diff

Correlation Matrix: Core Taiwan Economic Variables

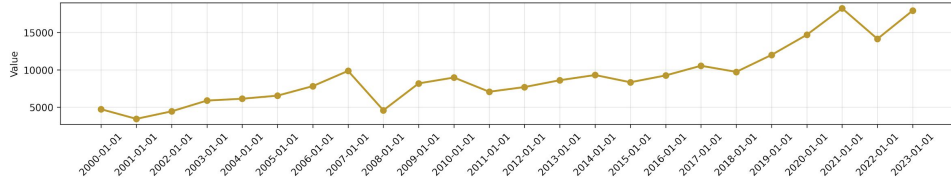


Time Series of All Variables

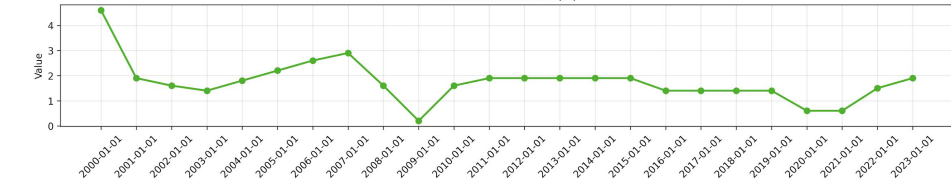
Taiwan_GDP_in_billions_usd



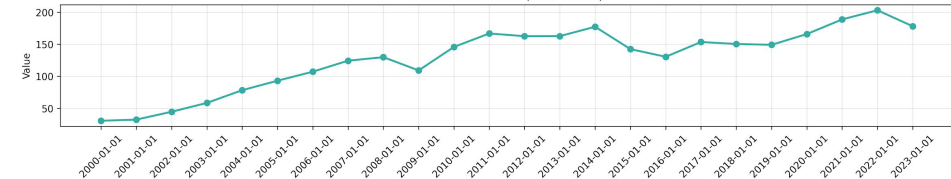
TAIEX Index



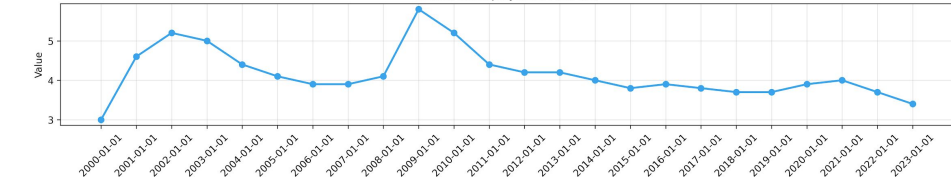
Taiwan Interest Rate (%)



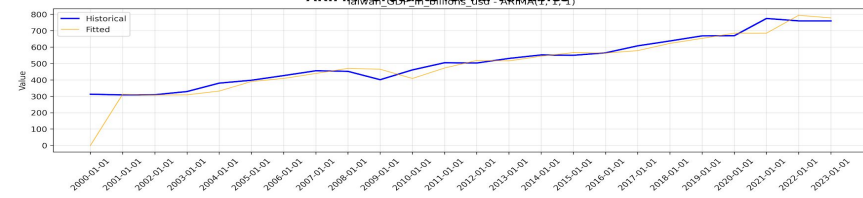
Taiwan-China Trade (USD Billions)



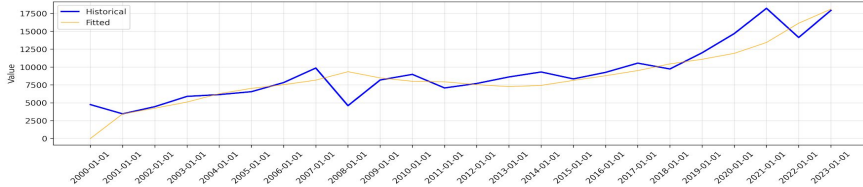
Taiwan Unemployment Rate (%)



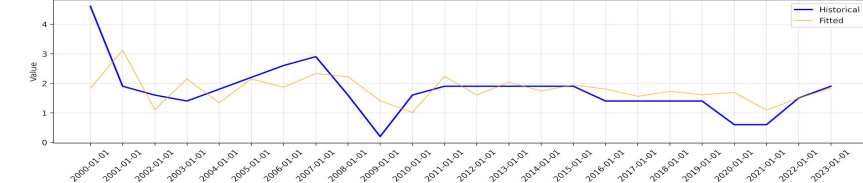
ARIMA Forecasts for All Variables



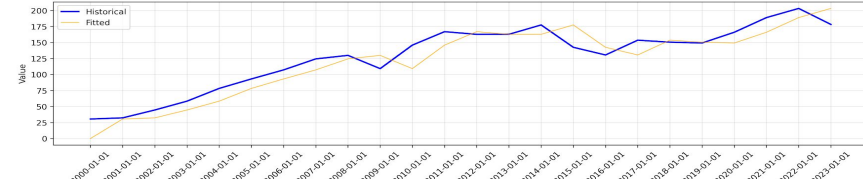
TAIEX index - ARIMA(1, 1, 2)



Taiwan Interest Rate (%) - ARIMA(0, 0, 1)



Taiwan-China Trade (USD Billions) - ARIMA(0, 1, 0)



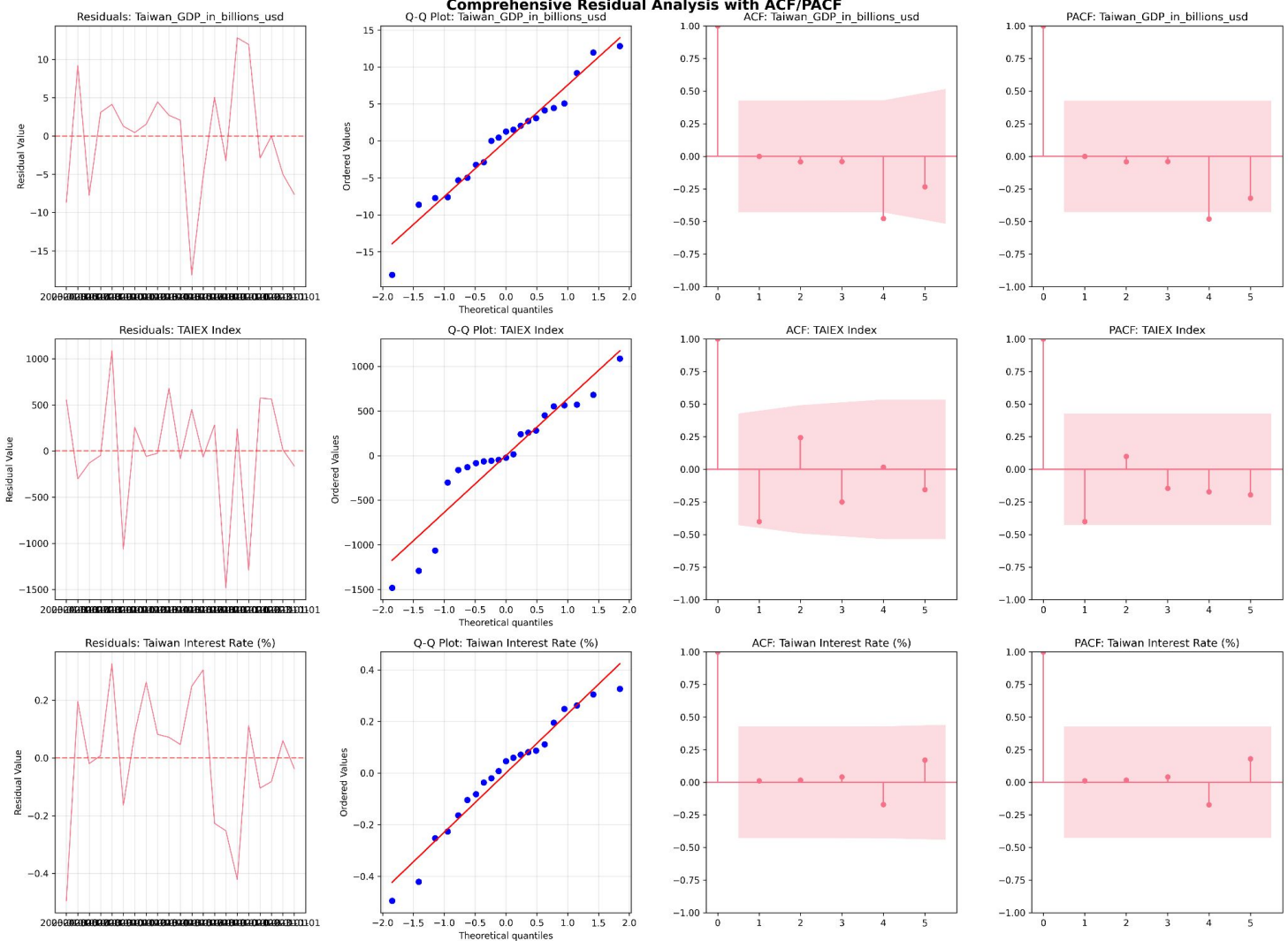
Taiwan Unemployment Rate (%) - ARIMA(0, 2, 2)



Taiwan_GDP_in_billions

Variable	Coefficient	Std. Error	t-Stat	Prob.
const	112.202279	80.888053	1.387	0.165
Taiwan-China Trade (USD Billions)_diff	0.453592	0.253504	1.789	0.074
US GDP Growth (%)	8.090908	1.704632	4.746	0.000
S&P 500 Index_diff	0.025774	0.010437	2.469	0.014
TWD/USD Exchange Rate	-3.751386	2.635972	-1.423	0.155
US Interest Rate (%)	0.459606	2.213452	0.208	0.836
L1.Taiwan_GDP_in_billions_usd_diff	-0.369660	0.164722	-2.244	0.025
L1.TAIEX Index_diff	0.004634	0.002275	2.036	0.042
L1.Taiwan Interest Rate (%)	7.316885	5.465179	1.339	0.181
L2.Taiwan_GDP_in_billions_usd_diff	-0.264266	0.149162	-1.772	0.076
L2.TAIEX Index_diff	0.002614	0.002198	1.189	0.234
L2.Taiwan Interest Rate (%)	-0.583611	6.275426	-0.093	0.926

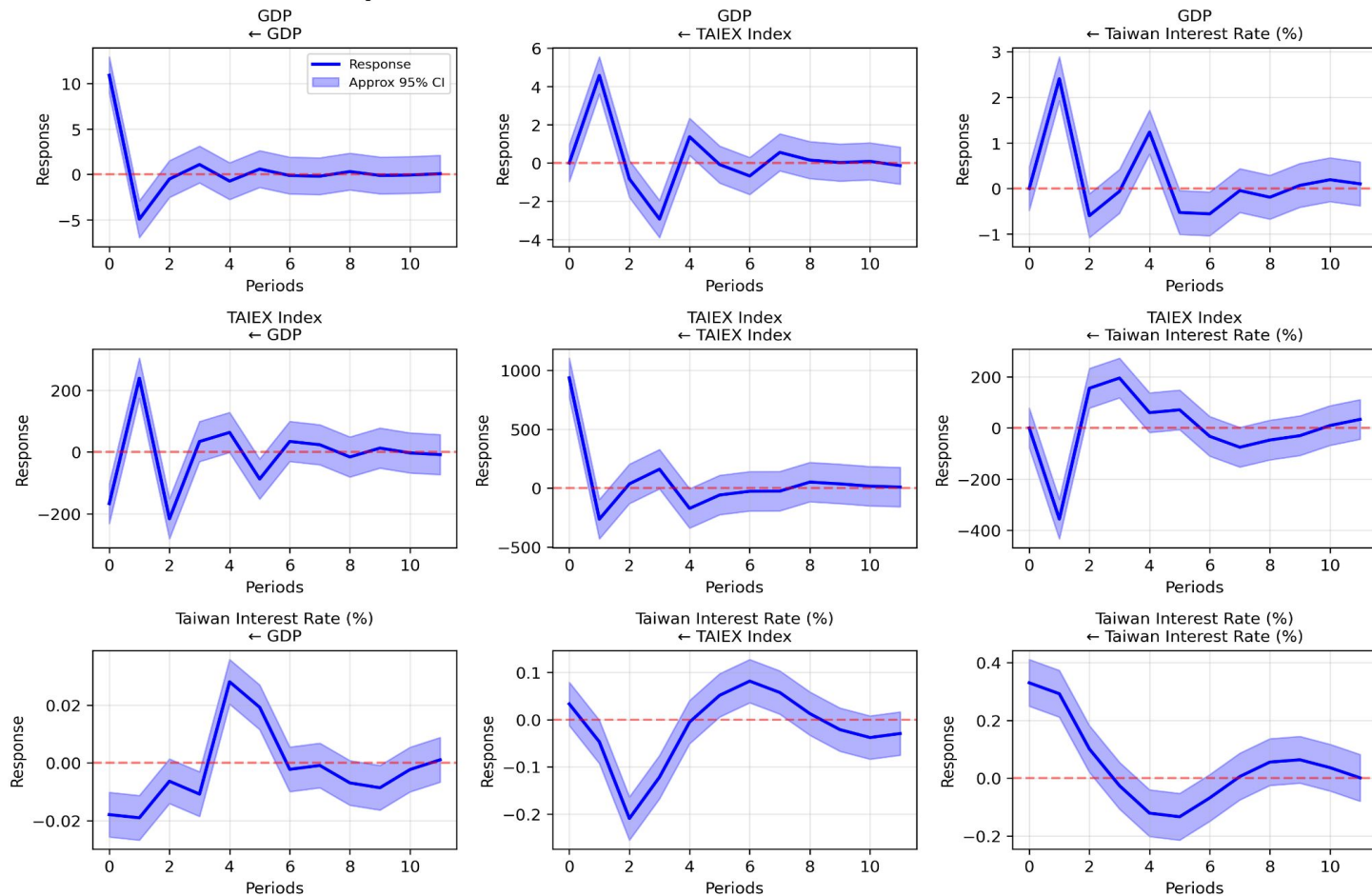
Comprehensive Residual Analysis with ACF/PACF



Series	D-W Statistic	Interpretation
Taiwan_GDP_in_billions_usd_diff	1.8751	No significant autocorrelation
TAIEX Index_diff	2.7609	Negative autocorrelation detected
Taiwan Interest Rate (%)	1.7268	No significant autocorrelation

Series	Ljung-Box Statistic	p-value
Taiwan_GDP_in_billions_usd_diff	8.1663	0.1473
TAIEX Index_diff	7.8016	0.1675
Taiwan Interest Rate (%)	1.7604	0.8812

Optimized Impulse Response Functions (Response of Row Variable to Column Variable Shock)



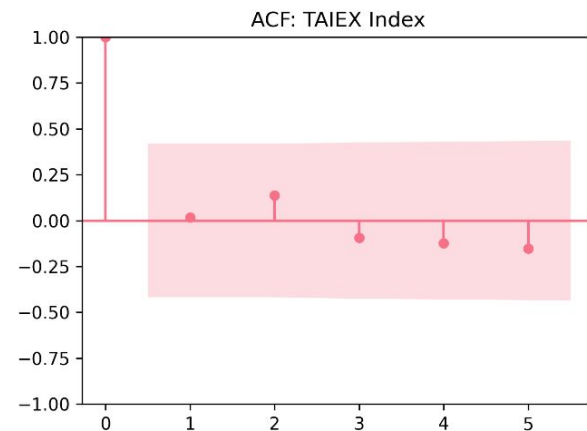
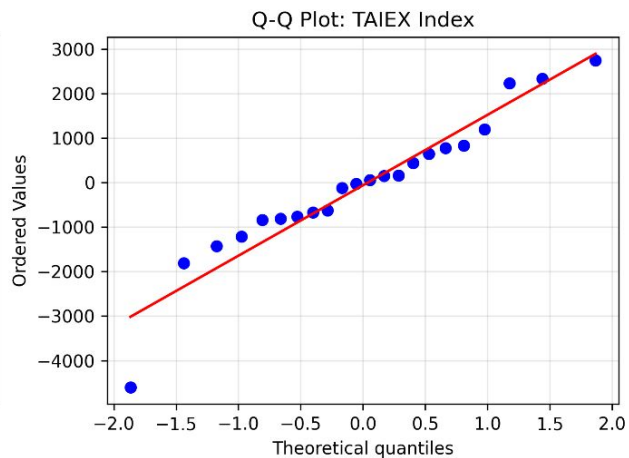
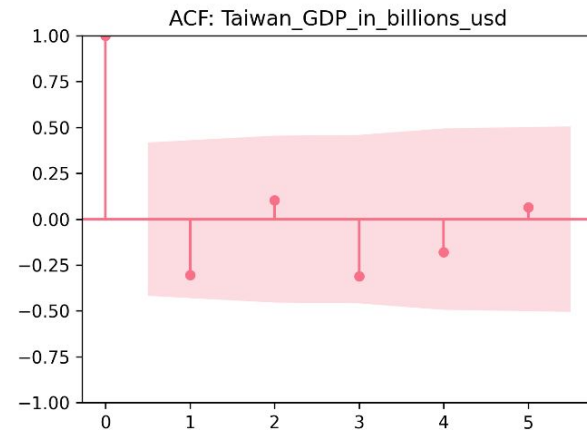
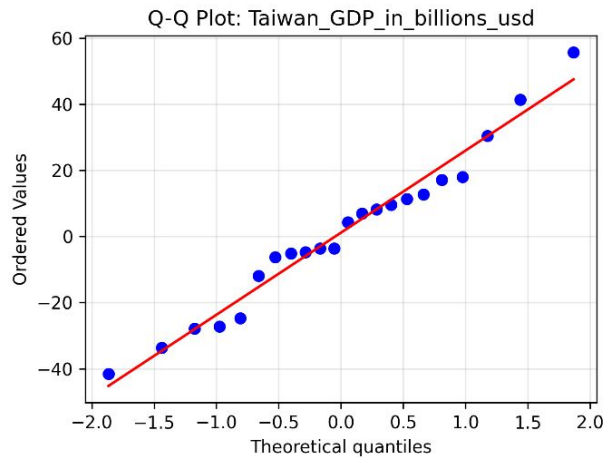
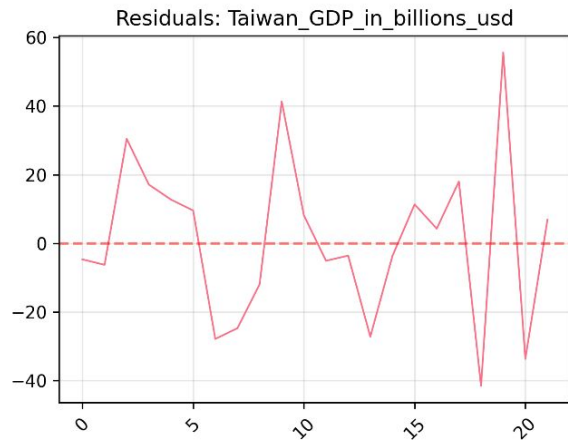
VECM

Test Type	Statistic (r)	Value	Critical Value	Cointegrating Relationships
Trace	$r \leq 0$	18.9462*	18.3985	1
	$r \leq 1$	1.4722	3.8415	
Eigenvalue	$r = 0$	17.4739*	17.1481	1
	$r = 1$	1.4722	3.8415	

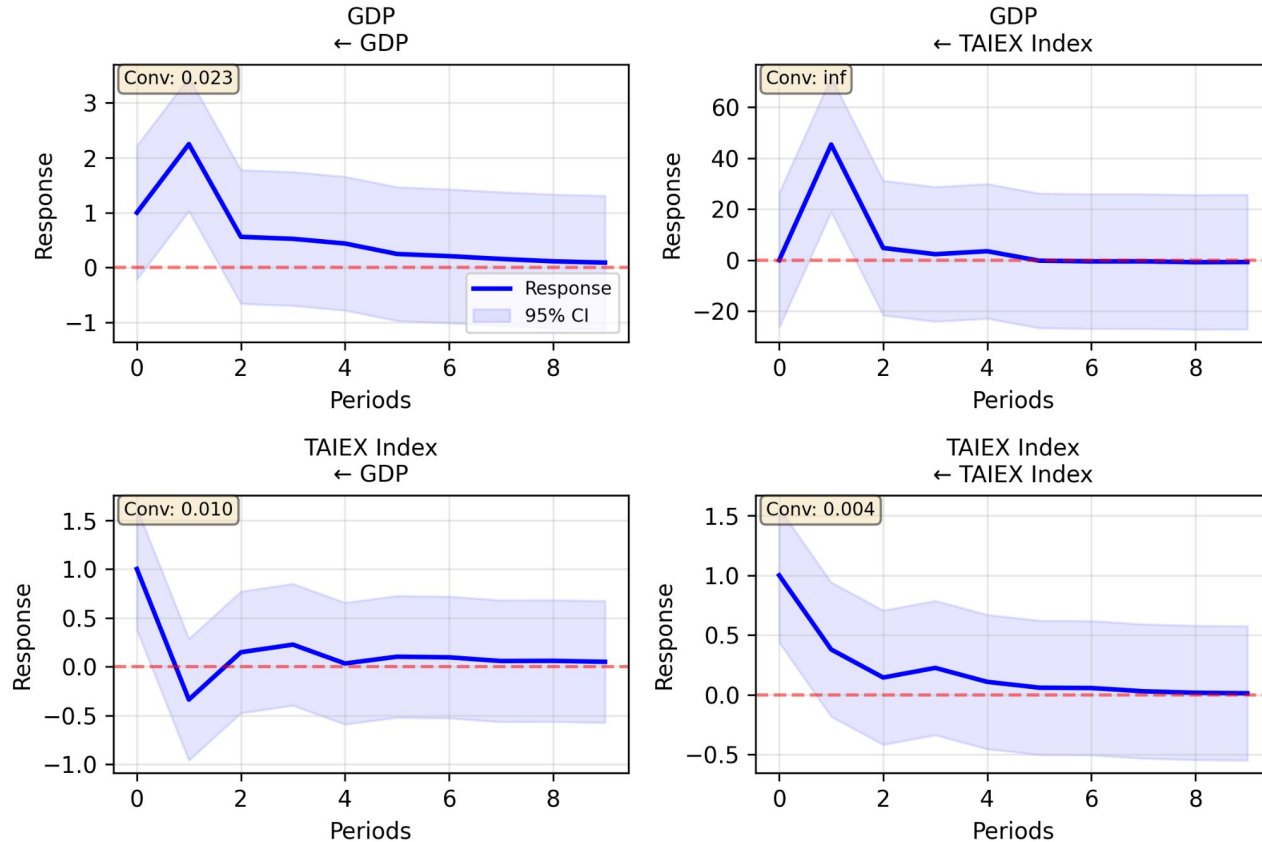
Variable	Adjustment Coefficient (Alpha) to Cointegrating Vector 1
Taiwan_GDP_in_billions_usd	0.1084
TAIEX Index	7.7147

Parameter	Coefficient	Std. Error	z-Statistic	P> z	[0.025	0.975]
beta.1	1.0000	0.000	0.000	0.000	1.000	1.000
beta.2	-0.0303	0.012	-2.483	0.013	-0.054	-0.006
const	-34.7050	107.227	-0.324	0.746	-244.866	175.456

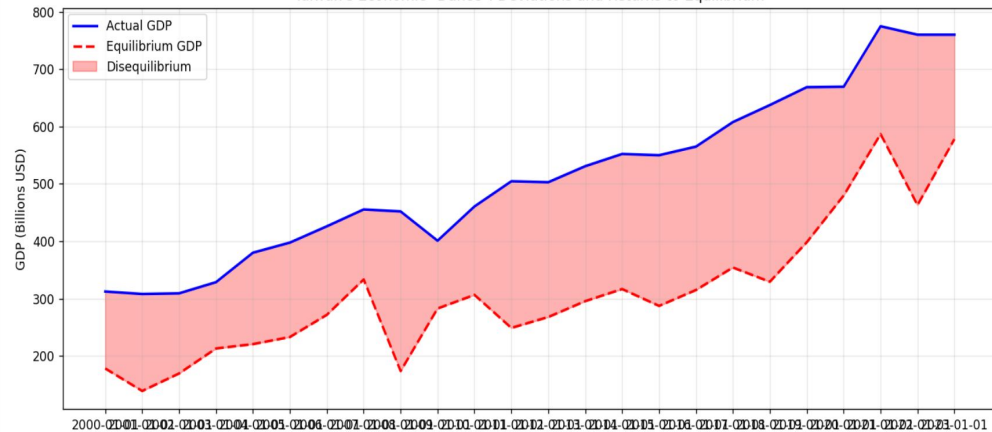
VECM Residual Analysis



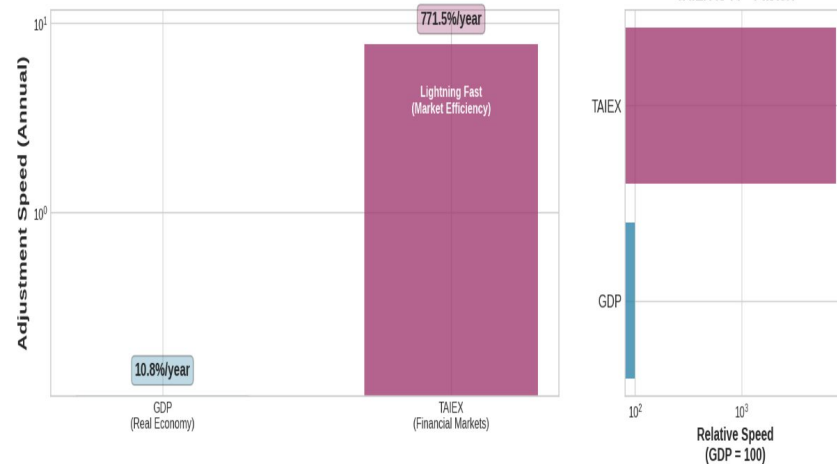
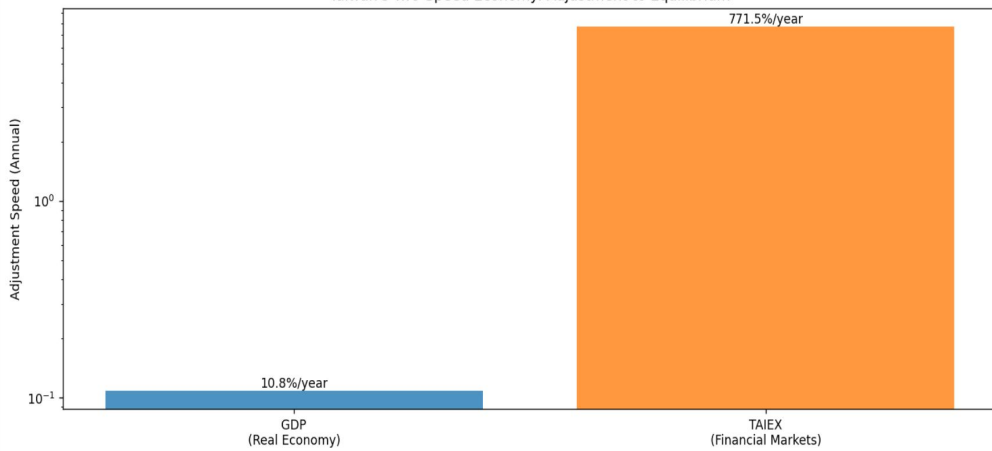
VECM Impulse Response Functions (Stabilized)



Taiwan's Economic "Dance": Deviations and Returns to Equilibrium



Taiwan's Two-Speed Economy: Adjustment to Equilibrium



Convergence to Equilibrium: The Path Back to Balance

