Understanding the Decline of Taiwan’s FDI in China: Economic and Geopolitical Drivers Across Manufacturing Sectors

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Abstract

The consistent decline in Taiwan's foreign direct investment (FDI) in China over the past 15 years raises critical questions about the factors driving this trend, particularly as China transitions toward a higher-value economy. This research contributes to the literature by focusing specifically on Taiwanese FDI, a unique case often overshadowed by broader analyses of China's FDI landscape. Using a time series regression model, I analyze monthly data from 2008 to 2023 to examine the impact of key economic and geopolitical factors on FDI in China's traditional and advanced manufacturing sectors. The findings reveal that rising Southeast Asian real GDP growth and China’s housing prices are significant deterrents to Taiwanese investment, with distinct effects across sectors. These results highlight the competitive dynamics of regional economic shifts and underscore China's evolving role in global value chains.

1. Introduction

Taiwanese businesses have been significant contributors to China's rapid economic growth during the late 1990s and early 2000s. By bringing technological and managerial expertise and establishing manufacturing bases on the mainland, Taiwanese investors played a crucial role in modernizing China's manufacturing sector. However, over the past 15 years, there has been a consistent decline in Taiwan's foreign direct investment (FDI) in China. This trend may have serious implications for cross-strait relations, both geopolitically and economically.

The recent decline in China's overall FDI has been widely studied, with existing literature attributing this trend to rising geopolitical risks, economic policy uncertainty, and China's evolving economic model. Geopolitical risks, such as trade tensions in the South China Sea, have prompted multinational firms to reassess their strategies (Caldara and Iacoviello 2018), while the U.S.-China trade war has driven diversification of supply chains to emerging economies, reducing reliance on China (Freund and Ruta 2021). Economic policy uncertainty has also negatively impacted investment decisions, particularly in advanced economies that are more sensitive to policy risks (Baker, Bloom, and Davis 2016). Southeast Asia's rapid economic growth has further intensified competition for FDI. Countries such as Vietnam and Malaysia have introduced favorable trade policies to attract foreign investors (ASEAN Secretariat 2019).

While much of the literature focuses on China's FDI patterns, Taiwan's case remains underexplored. This research addresses the gap by examining how Taiwan's FDI in China's traditional and advanced manufacturing sectors responds to geopolitical risks, economic policy uncertainty, and regional economic indicators from 2008 to 2023.

2. The Context and Data

This study utilizes a monthly time series dataset spanning January 2008 to December 2023, with each observation representing Taiwan's Approved Outward Investment (AOI) in either China's traditional or advanced manufacturing sector for a given month. The AOI, measured in millions of USD, serves as the response variable and represents the official measure of Taiwan's FDI in this sector. Both sectors include 192 observations, ensuring the reliability of analysis.

The variables of interest include a range of economic and geopolitical variables hypothesized to impact Taiwan's FDI in China. These include the GPR Index and the EPU Index, which capture the political and policy-related uncertainties that influence cross-border investments. China's, Taiwan's, and Southeast Asia's GDP growth, and exchange rate volatility between CNY and TWD are also treated as predictors which reflect market potential, cost factors, and currency risks, respectively. Lastly, the CNY-TWD exchange rate, and China's House Price Index (HPI) are included as controlled variables for isolating the effects of the main predictors on FDI inflows. A detailed summary statistics are presented in Table 1 of the Appendix Section A.

In terms of data source, the target variable of interest AOI was obtained from Taiwan's Ministry of Economic Affairs. The predictors GPR Index and the EPU Index were developed by Caldara and Iacoviello (2018) and Baker, Bloom, and Davis (2016), respectively. The GPR Index is a news-based measure constructed based on the share of news that mentioned adverse geopolitical events published in developed countries such as the United States, United Kingdom, and Canada (Caldara and Iacoviello 2018). The EPU Index uses a similar approach but is constructed based on the share of articles that contain keywords that imply economic uncertainty (Baker, Bloom, and Davis 2016). China's real GDP growth and HPI data were sourced from China's National Bureau of Statistics, while Taiwan's GDP growth and Southeast Asia GDP growth were purchased through CEIC. The CNY:TWD historical exchange rates were sourced from Investing.com, and its annual volatilities were then computed manually.

3. Preliminary Analysis

3.1 Overview of Combined AOI Data

A trend analysis of predictors from 2008 to 2023 reveals key patterns (Appendix, Figure 1). The GPR and EPU Index rise notably after 2016, reflecting prolonged geopolitical tensions and elevated uncertainty. China's real GDP growth declines steadily from 15% in 2008 to below 5% by 2020, with a brief recovery in 2021, aligning with its shift to a more moderate growth phase. In contrast**,** Southeast Asia's GDP growth remains relatively stable, reflecting consistent regional competitiveness. Taiwan's GDP growth shows moderate fluctuations around 5%, while the CNY:TWD exchange rate remains largely stable within a ±0.625% range.

3.2 Sectoral Overview and Comparisons

Visual comparisons of monthly AOI trends for traditional and advanced sectors (Appendix, Figure 2) indicate similar fluctuations and trends, suggesting shared influences of economic and geopolitical factors. However, the traditional sector attracts higher average AOI (634.98 vs. 376.56 million USD) and exhibits greater volatility, likely due to its broader industrial scope and established production bases. Both sectors show a clear decline in AOI post-2019, attributed to the COVID-19 pandemic and zero-COVID policies. Standardization of AOI is applied to enable meaningful comparisons. While both sectors may respond similarly to key predictors like geopolitical risks, further analysis is required to explore sector-specific sensitivities.

4. Regression Analysis

4.1 Model Specification

This study employs a time series regression model to analyze the economic and geopolitical drivers of Taiwan's FDI in China's manufacturing sectors. The dependent variable, AOI, measured monthly from January 2008 to December 2023, represents investment flows in both traditional and advanced manufacturing sectors.

To account for delayed impacts of economic and geopolitical factors on FDI inflow, the analysis incorporates lagged predictors: GPR Index is lagged by one month, reflecting short-term investor reactions to geopolitical events (Caldara and Iacoviello 2018). EPU Index is lagged by six months, capturing delayed responses to policy uncertainty (Baker, Bloom & Davis, 2016). HPI and Real GDP Growth of China, Taiwan, Southeast Asia are lagged by 1-year to account for firms' reaction time.

To ensure the robustness of the analysis, tests for stationarity, autocorrelation, homoscedasticity, multicollinearity, and normality of residuals were conducted, with detailed results provided in Section B of the Appendix. The stationarity of the data was confirmed through the Augmented Dickey-Fuller test, while the Durbin-Watson test indicated no significant autocorrelation in the residuals. Multicollinearity was ruled out based on Variance Inflation Factor (VIF) scores, and the residuals were found to approximate normality by the residual plots. While minor heteroscedasticity issues were detected via visual inspection of residual plots, robust standard errors were applied throughout the analysis to address this concern and ensure reliable inference.

4.2 Regression Results

4.2.1 Findings from the Combined AOI Analysis

The regression analysis explores the relationship between combined AOI for traditional and advanced manufacturing sectors and key economic and geopolitical predictors. Robust standard errors address potential heteroscedasticity, and the model explains approximately 27.9% of the variation in monthly FDI inflows (Appendix C).

A one-unit increase in the EPU Index, lagged six months, reduces AOI by 0.877 million USD per month, significant at the 5% level, while holding other factors constant. This finding suggests that heightened policy uncertainty diminishes Taiwanese investor confidence, though the effect size indicates a relatively modest immediate impact compared to other predictors. Southeast Asia's GDP growth, lagged by one year, has a substantial negative impact, with each one-percentage-point increase associated with a 4644 million USD reduction in monthly AOI, significant at the 5% level. This result highlights regional competition, as stronger Southeast Asian economies attract investment away from China. HPI, lagged by one year, also negatively impacts AOI, with a one-unit increase linked to an 11.01 million USD reduction, significant at the 5% level. Rising HPI likely reflects broader economic pressures, such as labor and operational cost increases, reducing China's attractiveness as a low-cost manufacturing hub.

Other variables, including the GPR Index, exchange rate volatility, and GDP growth rates of China and Taiwan, are statistically insignificant. This could suggest that these factors influence FDI decisions over longer time horizons or exhibit sectoral variability. The lack of significance for China's GDP growth may reflect multicollinearity with HPI, while Taiwan's GDP growth insignificance indicates limited direct influence on combined AOI.

Overall, the combined AOI analysis highlights the significant diversionary effect of Southeast Asia's growth, the modest impact of policy uncertainty, and the implications of rising costs in China. These findings are further examined through sectoral analysis and lag sensitivity tests.

4.2.2 Sectoral-Specific FDI Dynamics

The sectoral analysis attempts to explore on how traditional and advanced manufacturing respond differently to economic and geopolitical factors, revealing their unique priorities.

In the traditional manufacturing sector, Southeast Asia's GDP growth has a significant negative impact on Taiwanese investment in China. A one percent increase in Southeast Asia's growth is associated with a 6.76 standard deviation drop in Taiwanese FDI. This likely reflects competition from Southeast Asian countries, which offer lower labor costs and attract businesses focused on cost efficiency. Rising HPI, which serves as a proxy for increasing labor and operational costs in China, reduces FDI by 0.022 standard deviations—a statistically significant result. Additionally, Taiwan's GDP growth positively influences investment in the traditional sector, with a one-unit increase leading to a 5.16 standard deviation rise, suggesting stronger ties between Taiwan's domestic economic activity and its traditional manufacturing investments abroad. However, other factors, such as geopolitical risk, economic policy uncertainty and exchange rate volatility, were not statistically significant for this sector.

In contrast, the advanced manufacturing sector shows greater sensitivity to external competition. A one-unit increase in Southeast Asia's GDP growth is associated with an even larger reduction—8.42 standard deviations—in Taiwanese FDI in China. Over the past decade, countries like Malaysia and Vietnam have actively enhanced their infrastructure, workforce skills, and technological capabilities to attract high-tech industries. For example, Malaysia's Penang region has become a key hub for semiconductor manufacturing, drawing investments from global companies through "friendshoring" strategies (ASEAN Secretariat 2019). Vietnam's development in chip packaging has made it an attractive alternative for Taiwanese advanced manufacturing firms seeking to diversify amid trade tensions with China (Freund and Ruta 2021).

The R-squared values—0.29 for the traditional sector and 0.21 for the advanced sector—indicate that while the models explain some variation in FDI, there are likely additional factors influencing investment decisions. The differences in sectoral sensitivities underscore their contrasting priorities: traditional manufacturing relies more on cost efficiencies and domestic linkages, while advanced manufacturing is more responsive to regional competition.

While these explanations are speculative, they underscore the need for further investigation. Testing alternative lag structures robustness check will help clarify whether the relationship is robust or contingent on specific conditions.

4.3 Lag Sensitivity Check

To ensure the reliability of these findings, we conducted robustness checks using lagged structures of 6 and 12 months for key variables, including the GPR Index and exchange rate volatility. The detailed steps and results are presented in Appendix Section D. These checks confirmed that the significant effects observed for Southeast Asia and Taiwan's real GDP growths, and HPI were consistent across different lag specifications. While the EPU Index occasionally displayed marginal significance in longer lags, the overall findings remained robust, suggesting that the relationships identified in the main analysis are stable under varying model assumptions.

5. Conclusion

5.1 Summary of findings

This report has explored the determinants of Taiwan's FDI in China's manufacturing sector from 2008 to 2023, focusing on the combined and sectoral levels. The findings reveal several insights.

The analysis identified Southeast Asia's GDP growth and China's HPI to be significant in influencing aggregate FDI inflows, underscoring the increasing competitiveness that China is facing from neighboring emerging economies, the internal cost pressures in China, and potentially, China's evolving economic model.

At the sectoral level, significant variations emerged between the traditional and advanced manufacturing sectors. Southeast Asia's growth exerted a stronger pull on the advanced sector's FDI, while Taiwan's growth had a larger effect on the traditional sector. These differences show that the two sectors may have different priorities, with traditional manufacturing focusing on cost efficiencies and advanced manufacturing responding to global market dynamics.

These findings were tested for sensitivity to lag structures. The results remained significant across 6-month and 12-month lag specifications for geopolitical risk and exchange rate volatility, suggesting that the core relationships are robust.

5.2 Policy Implications

Should China be concerned about the decline in Taiwan's FDI? Historically, Taiwanese businesses were drawn to China by low labor costs and favorable conditions, but rising costs have shifted investments to cheaper alternatives like Southeast Asia. This trend isn't necessarily harmful to China's economy. Instead, it aligns with China's transition from low-value manufacturing to high-value industries, as seen in initiatives like *Made in China 2025* (State Council of the People's Republic of China 2015), which promote innovation and advanced manufacturing. Our findings support this view, with the negative correlation between Southeast Asia's GDP growth and Taiwan's FDI in China suggesting China is losing competitiveness in low-cost manufacturing. However, this shift can enable China to refocus on sectors requiring advanced technologies and skilled labor.

5.3 Limitations and Future Research

While this research provides some insights into the factors influencing Taiwan's FDI in China's manufacturing sectors, it has several limitations that undermine its internal and external validity.

One challenge to this study's internal validity is the potential for omitted variable bias, especially due to the absence of a direct measure of labor costs. Labor costs are a well-established driver of FDI decisions, influencing both the dependent variable AOI and key predictors like GDP growth. While HPI was included as a proxy, it does not fully capture the effects of labor costs, such as sector-specific wages or regional differences. This omission means that the estimated coefficients for the included predictors might be biased, either overestimating or underestimating their true effects. Additionally, the relatively small sample size (192 observations for the combined analysis and 180 for sector-specific regressions) limits the statistical power of the analysis, making it harder to identify smaller effects. Another challenge arises from the study period (2008–2023), which spans major global events like the financial crisis and the COVID-19 pandemic. These events introduced unique economic disruptions, including sudden shifts in trade patterns and policy interventions, which may have influenced FDI in ways not fully accounted for in the model. Together, these issues limit the ability to make strong causal inferences.

The external validity of this research is limited by the unique characteristics of the Taiwan-China economic relationship, which may not be fully generalizable to other countries. Moreover, this study focuses exclusively on traditional and advanced manufacturing sectors, which have their own distinct drivers and competitive dynamics, and hence may not generalize well to other industries. Finally, the studied time frame excludes earlier periods when Taiwan's investments in China were at their peak, meaning the analysis may not fully account for long-term structural changes in the relationship. While the findings provide valuable insights into Taiwan's FDI trends, they should be interpreted with caution when applied to other contexts.

6. References

ASEAN Secretariat. 2019. *ASEAN Investment Report 2019: FDI in Services – Focus on Health Care*. Jakarta: ASEAN Secretariat.

Baker, Scott R., Nicholas Bloom, and Steven J. Davis. 2016. "Measuring Economic Policy Uncertainty." *The Quarterly Journal of Economics* 131 (4): 1593–1636. https://doi.org/10.1093/qje/qjw024.

Caldara, Dario, and Matteo Iacoviello. 2018. "Measuring Geopolitical Risk." *International Finance Discussion Papers* 1222. Board of Governors of the Federal Reserve System. https://doi.org/10.17016/IFDP.2018.1222.

Freund, Caroline, and Michele Ruta. 2021. "The Belt and Road Initiative and the Making of a New Economic Order." *The World Bank Economic Review* 35 (2): 258–83. https://doi.org/10.1093/wber/lhab010.

State Council of the People's Republic of China. 2015. "*Made in China 2025*." Last modified May 19, 2015. https://www.gov.cn/zhengce/content/2015-05/19/content_9784.htm.

Investing.com. n.d. "CNY to TWD Historical Data." Accessed November 2023. https://www.investing.com.

Taiwan's Ministry of Economic Affairs. n.d. "Approved Outward Investment Statistics." Accessed November 2023. https://www.moea.gov.tw.

CEIC. n.d. "Taiwan and Southeast Asia GDP Growth Data." Accessed November 2023. https://www.ceicdata.com.

7. Appendix

A. Preliminary Analysis & Summary Statistics

Table 1: Summary Statistics of Combined AOI and Key Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
aoi combined	192	983.632	688.674	53.975	3846.338
gpr lag1m	192	.624	.333	.207	2.475
epu lag6m	192	190.409	121.046	46.671	661.828
chngdpgrowth lag1y	192	.077	.027	.022	.142
seaavggdpgrowth l~1y	192	.046	.023	-.033	.074
hpi lag1y	192	114.335	19.034	81.82	145.91
taiwangdpgrowth l~1y	192	.034	.026	-.016	.102
exmonthlychange l~1m	192	0	.014	-.033	.05
exstd lag1m	192	.013	.004	.007	.022

Table 2: Summary Statistics of AOI by Sector

Variable	Obs	Mean	Std. Dev.	Min	Max
aoi trad	192	617.014	439.255	30.461	2085.094
aoi adv	192	366.618	286.692	15.74	1768.257

Figure 1: Trends of Key Predictors from 2007 to 2023

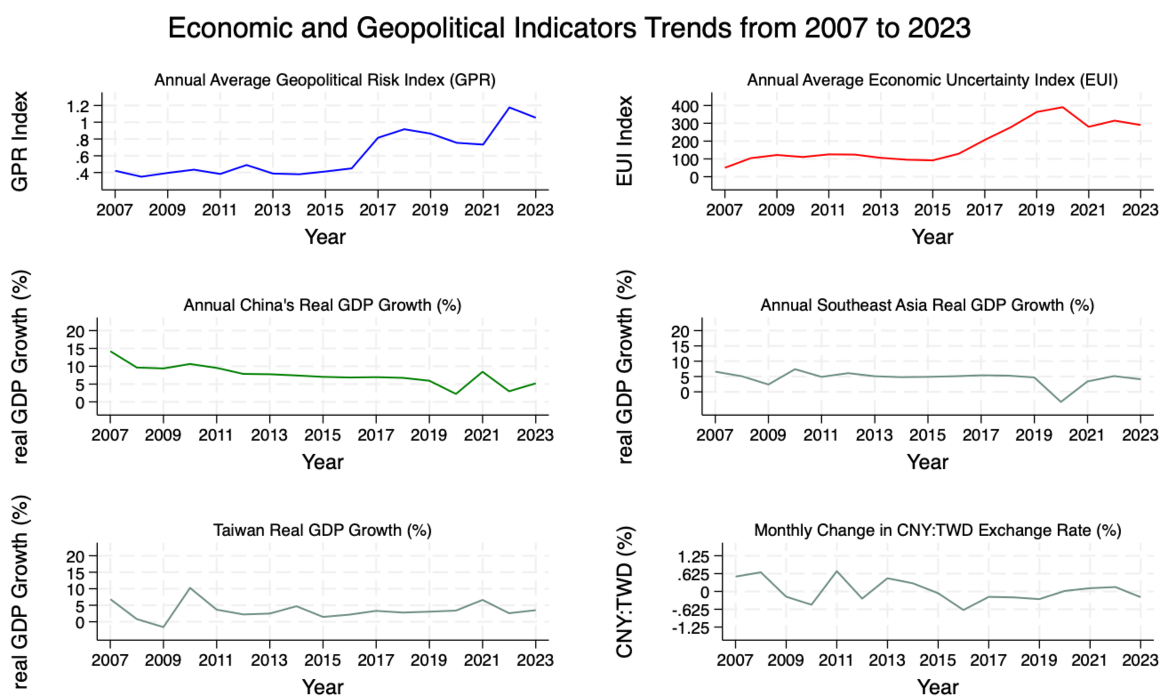
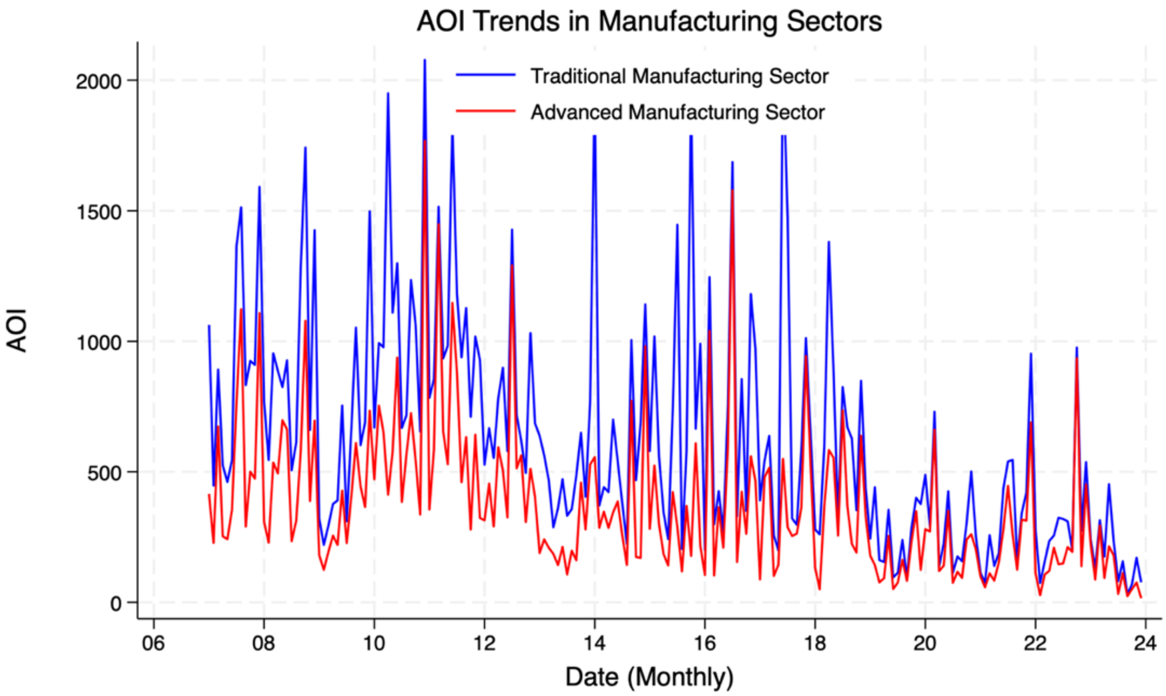


Figure 2: Visual Comparison of AOI Between Sectors



B. Preliminary Tests for Time Series Properties

Before diving into the main analysis, four preliminary tests were run to ensure the time series data meets key assumptions. With a sample size of only 192 observations, it's especially important to confirm that the data behaves as expected to avoid misleading results.

1. Stationarity Test

To start, the Dickey-Fuller test was applied on the main response variable AOI. Stationarity is a fundamental requirement in time series analysis, as it ensures that the mean and variance of the data do not change over time.

The resulting Dickey-Fuller test statistic was -9.808, well below the 1% critical value of -3.480 and the resulting p-value was less than 0.01, leading to a rejection of the null hypothesis of a unit root. Differencing is not needed to achieve stationarity.

```
Dickey-Fuller test for unit root          Number of obs  = 191
Variable: aoi_combined                    Number of lags =   0

H0: Random walk without drift, d = 0

                                       Dickey-Fuller
                   Test         -------- critical value ---------
              statistic           1%           5%          10%
-------------------------------------------------------------------
 Z(t)            -9.808       -3.480       -2.884       -2.574
-------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.0000.
```

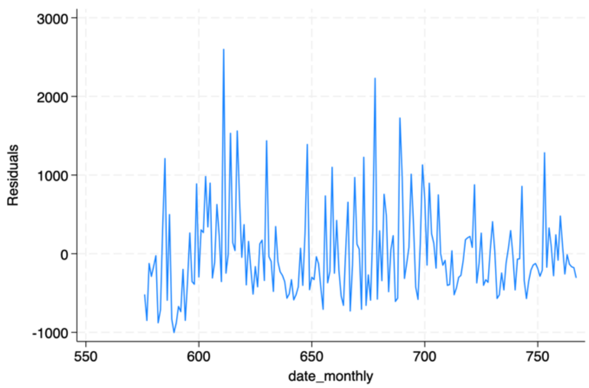
2. **Autocorrelation Test**

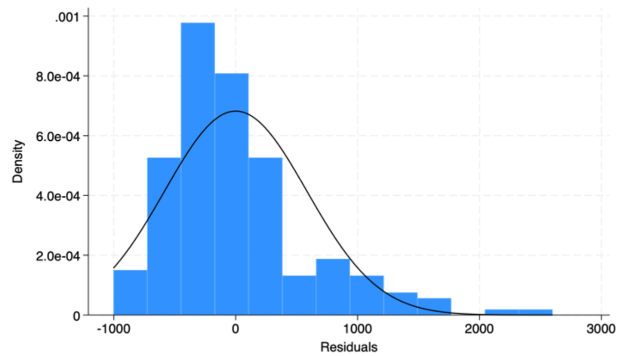
The presence of autocorrelation in the residuals was examined using the Durbin-Watson test. Autocorrelation can violate regression assumptions and compromise the accuracy of coefficient estimates.

The resulting Durbin-Watson d-statistic was 1.898, close to the ideal value of 2, suggesting autocorrelation is not a significant issue. As a result, no adjustments for correlated errors are made.

3. **Residual Analysis**

To supplement the formal tests, the residuals of the regression model were further analyzed to verify the normal distribution and homoscedasticity assumptions.





A histogram of the residuals, overlaid with a normal distribution curve, shows that they are close to a normal distribution, with only slight right skewness. In addition, the residuals are plotted over time to check for homoscedasticity. The residuals show some mild clustering at certain points, which could suggest minor heteroscedasticity, especially relevant in a small sample size like ours. To address potential heteroscedasticity, robust standard errors will be used in the main analysis.

4. **Multicollinearity Checks**

Multicollinearity is a common issue in regression models where two or more predictors are highly correlated. In such cases, distinguishing the individual impact of each predictor on the response variable becomes difficult, leading to less reliable and interpretable coefficients.

We conducted an initial Variance Inflation Factor (VIF) check to assess multicollinearity among the main effects without interaction terms. High VIF values, typically above 10, indicated significant multicollinearity.

The initial VIF results revealed that none of the predictors exceed the threshold of 10, indicating potential multicollinearity issues are not significant in the main effect model. All predictors are retained in the model without concern.

C. Regression Results

Table 3: Regression Results for the combined model of the two sectors

	(1)
VARIABLES	aoi_combined
gpr_lag1m	-75.18
	(150.8)
epu_lag6m	-0.877**
	(0.440)
chngdpgrowth_lag1y	3,195
	(3,199)
seaavggdpgrowth_lag1y	-4,644**
	(1,974)
hpi_lag1y	-11.01**
	(5.337)
exstd_lag1m	11,720
	(11,879)
taiwangdpgrowth_lag1y	2,648
	(2,427)
exmonthlychange_lag1m	-54.71
	(3,233)
Constant	2,178***
	(731.6)
Observations	192
R-squared	0.279

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4: Regression Results for the Traditional and Advanced Manufacturing Sectors

	(1)	(2)
VARIABLES	Traditional Sector	Advanced Sector
gpr_lag1m	-0.112	0.0842
	(0.208)	(0.263)
epu_lag6m	-0.000879	-0.000895
	(0.000721)	(0.000678)
chngdpgrowth_lag1y	5.777	8.813
	(4.278)	(5.624)
seaavggdpgrowth_lag1y	-6.764**	-8.419***
	(2.721)	(3.192)
hpi_lag1y	-0.0219***	-0.0151
	(0.00705)	(0.00960)
exstd_lag1m	-9.425	13.69
	(18.36)	(18.78)
taiwangdpgrowth_lag1y	5.159*	4.136
	(2.896)	(4.210)
exmonthlychange_lag1m	2.347	-3.453
	(4.944)	(5.606)
Constant	2.583***	1.257
	(0.967)	(1.248)
Observations	180	180
R-squared	0.290	0.210

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

D. Robustness Check

1. Lag Sensitivity Analysis for Combined AOI

To assess the robustness of our findings, lag sensitivity checks are performed by incorporating 6-month and 12-month lags for the GPR Index and exchange rate volatility. The results in Table 5 indicate that the key determinants, namely Southeast Asia's real GDP growth and HPI, remain consistently significant across all lag specifications. Specifically, Southeast Asia's real GDP growth exhibits a persistent negative effect on AOI, with coefficients ranging between -5.09 and -5.53, significant at the 5% level or better. This reinforces the interpretation that economic growth in Southeast Asia diverts Taiwanese FDI from China. Similarly, the negative association between HPI and AOI, with coefficients between -13.58 and -14.73, supports the hypothesis that rising property values in China are correlated with a reduction in Taiwanese investment, potentially through higher labor or operational costs.

However, the GPR Index and exchange rate volatility remain statistically insignificant across all lag specifications, suggesting that they do not have a measurable effect on aggregate AOI during the sample period. The R-squared values, which remain stable around 0.28 to 0.29, indicate a consistent explanatory power for the model across lag structures.

Table 5: 6-month and 12-month lag sensitivity check for combined AOI

VARIABLES	(1) Lag 1: GPR and ExStd	(2) Lag 6: GPR and ExStd	(3) Lag 12: GPR and ExStd
gpr_lag1m	-25.15		
	(160.2)		
epu_lag6m	-0.643	-0.880*	-0.709
	(0.463)	(0.469)	(0.458)
chngdpgrowth_lag1y	5,064	4,197	4,551
	(3,354)	(3,541)	(3,483)
seaavggdpgrowth_lag1y	-5,385***	-5,530***	-5,098**
	(2,016)	(1,962)	(2,000)
hpi_lag1y	-13.93**	-14.73**	-13.58**
	(5.581)	(5.678)	(5.283)
exstd_lag1m	-215.8		
	(12,779)		
taiwangdpgrowth_lag1y	3,452	4,056	3,607

	(2,354)	(2,554)	(2,432)
exmonthlychange_lag1m	41.04	-141.3	100.00
	(3,538)	(3,534)	(3,453)
gpr_lag6m		139.0	
		(150.6)	
exstd_lag6m		13,570	
		(13,912)	
gpr_lag12m			5.449
			(163.4)
exstd_lag12m			9,260
			(14,901)
Constant	2,479***	2,384***	2,329***
	(747.6)	(789.0)	(745.6)
Observations	180	180	180
R-squared	0.282	0.288	0.283

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

2. Sectoral Lag Sensitivity Analysis

2.1 Traditional Manufacturing Sector

In the traditional sector, the sensitivity check results mirror the patterns observed in the aggregate AOI. Southeast Asia's real GDP growth maintains a robust and significant negative effect, with coefficients ranging from -6.22 to -7.07 across lags, all significant at the 5% level. This suggests that the traditional manufacturing sector remains particularly vulnerable to economic competition from Southeast Asia.

HPI continues to exhibit a significant negative effect on traditional sector AOI, with coefficients ranging from -0.0211 to -0.0232, all significant at the 1% level. Taiwan's real GDP growth retains its positive and significant effect, with coefficients around 5.16 to 5.92, which are significant at the 10% level across specifications. These findings suggest that traditional manufacturing retains stronger ties to Taiwan's domestic economic conditions. Neither the GPR

Index nor exchange rate volatility exhibits statistical significance, consistent with the aggregate AOI results.

2.2 Advanced Manufacturing Sector

The advanced sector's sensitivity check reveals a similar pattern to the traditional sector but with some notable distinctions. Southeast Asia's GDP growth remains significantly negative, with coefficients ranging from -8.25 to -8.46, significant at the 1% level. This reinforces the interpretation that advanced manufacturing FDI is especially sensitive to economic developments in competing regions like Southeast Asia.

HPI shows marginal significance in the 6-month and 12-month lag specifications, with coefficients around -0.0151, significant at the 10% level. This suggests that while property values may influence advanced sector FDI, the effect is less pronounced compared to the traditional sector. Notably, exchange rate volatility becomes marginally significant in the 6-month lag specification, with a coefficient of 26.53, suggesting some sensitivity to exchange rate volatility in the advanced sector. The GPR Index remains consistently insignificant.

Table 6: 6-month and 12-month lag sensitivity check for traditional manufacturing sector AOI

	(1)	(2)	(3)
VARIABLES	Traditional: Lag 1	Traditional: Lag 6	Traditional: Lag 12
gpr_lag1m	-0.112		
	(0.208)		
epu_lag6m	-0.000879	-0.00125*	-0.00110
	(0.000721)	(0.000746)	(0.000735)
chngdpgrowth_lag1y	5.777	4.243	4.191
	(4.278)	(4.362)	(4.621)
seaavggdpgrowth_lag1y	-6.764**	-7.067***	-6.221**
	(2.721)	(2.628)	(2.968)
hpi_lag1y	-0.0219***	-0.0232***	-0.0211***
	(0.00705)	(0.00765)	(0.00683)

exstd_lag1m	-9.425		
	(18.36)		
taiwangdpgrowth_lag1y	5.159*	5.925*	5.487*
	(2.896)	(3.147)	(3.004)
exmonthlychange_lag1m	2.347	2.166	2.360
	(4.944)	(5.034)	(4.761)
gpr_lag6m		0.142	
		(0.195)	
exstd_lag6m		13.58	
		(23.00)	
gpr_lag12m			-0.0373
			(0.261)
exstd_lag12m			15.64
			(19.79)
Constant	2.583***	2.448**	2.240**
	(0.967)	(1.116)	(0.960)
Observations	180	180	180
R-squared	0.290	0.292	0.291

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 7: 6-month and 12-month lag sensitivity check for advanced manufacturing sector AOI

	(1)	(2)	(3)
VARIABLES	Advanced: Lag 1	Advanced: Lag 6	Advanced: Lag 12
gpr_lag1m	0.0842		
	(0.263)		
epu_lag6m	-0.000895	-0.00115*	-0.000792
	(0.000678)	(0.000652)	(0.000623)
chngdpgrowth_lag1y	8.813	8.139	9.453

	(5.624)	(6.061)	(5.726)
seaavggdpgrowth_lag1y	-8.419***	-8.462***	-8.249***
	(3.192)	(3.107)	(2.915)
hpi_lag1y	-0.0151	-0.0158*	-0.0151*
	(0.00960)	(0.00900)	(0.00866)
exstd_lag1m	13.69		
	(18.78)		
taiwangdpgrowth_lag1y	4.136	5.068	4.173
	(4.210)	(4.484)	(4.297)
exmonthlychange_lag1m	-3.453	-3.812	-3.267
	(5.606)	(5.503)	(5.520)
gpr_lag6m		0.268	
		(0.242)	
exstd_lag6m		26.53	
		(17.94)	
gpr_lag12m			0.0762
			(0.224)
exstd_lag12m			8.342
			(23.16)
Constant	1.257	1.136	1.260
	(1.248)	(1.203)	(1.214)
Observations	180	180	180
R-squared	0.210	0.220	0.209

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1