THE WEST, CHINA, AND TAIWAN RELATIONSHIP: AN ECONOMETRIC APPROACH TO EVALUATING TENSIONS

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ABSTRACT

In this research project, the tensions between China, the United States, and Taiwan under Xi Jinping government will be investigated. The proposal is to verify the motivations for the increase about tensions between 2012-2022, addressing the security and economic relations among the countries. The levels of tension between China, United States, and Taiwan are very high, and the Chinese government of Xi Jinping has tried to isolate the island diplomatically, economically from the international system, and to reduce the American government's support from Taiwan. Against this backdrop, the research will seek to understand whether with the rising tensions China is getting closer to having an offensive against Taiwan to achieve its goal of national regeneration. And from another perspective the research will seek to understand, how China's economic relations with the US can influence and be influenced by Sino-Taiwanese relations.

Keywords: China; Security; International Economy; Pearson's Correlation; Spatial Econometrics.

1 INTRODUCTION

The Republic of China (ROC), or Taiwan, is an island located 200 km from the People's Republic of China (PRC), governed independently and recognized as a sovereign state by 20 nations worldwide (BARBOSA, JUNIOR, and SATUR, 2016). The PRC considers the island a rebellious province that is part of its territory (VLADIMIR IVANOV, 2022). Russia's occupation of Ukraine, beginning on February 24, 2022, with tacit support from China for the invasion, has fueled speculations within the international system regarding Beijing's intentions toward Taiwan (YEUNG, GAN, and JIANG, 2022). For instance, Tadeu (2022) suggests that China's abstention from voting in the United Nations Security Council on a resolution condemning Russia raised global concerns about the possibility of a Chinese attack on the island.

Furthermore, it has been observed that over the past few decades, the United States has sought to enhance Taiwan's involvement in the international system concerning trade and security (WENZHAO, 2017). China perceives this effort as an action that exacerbates tensions with Taiwan, potentially necessitating the use of force to assert control over the island (HERNÁNDEZ, 2016; TRENT, 2020).

In this context, Chinese assertions of a singular China in the region view such actions as violations of their sovereignty. Conversely, the U.S. Congress upholds its commitment to supporting Taiwan's vibrant democracy.

Therefore, according to Hsu, Hsu, and He (2021), the complexity of relations between both sides of the Taiwan Strait cannot be portrayed solely from a political or security perspective; it also warrants an economic approach to better understand the levels of tension between these nations. Given that their foreign trade is significantly intertwined, with China accounting for over $82 billion and the United States approximately $40 billion of Taiwan's trade (MA, 2022), it is essential to analyze these aspects.

Since foreign trade and national security are closely linked, metrics such as Pearson's linear correlation, logistic regression, and spatial econometrics can facilitate the research process to statistically assess whether rising tensions on both sides of the Strait may be increasing or decreasing the percentage of Chinese investments in the Taiwanese market (PIETRAFESA and SILVA, 2019). Overall, it is evident that Chinese

hostility toward Taiwan is intensifying, largely due to Taiwan's increasing westernization (TIAN and LEE, 2020). Consequently, this may also result in a reduction of Taiwanese investments in Mainland China (YEUNG, GAN, and JIANG, 2022).

The linear correlation and logistic model indicate that Taiwan may adopt aggressive stances even in cooperative scenarios with China (PIETRAFESA and SILVA, 2019). Some studies, such as Christensen (2006), illustrate that Taiwan represents the most sensitive issue in Sino-American relations. Meanwhile, research conducted by Wang (2013), Huang (2017), and Rato (2020) focuses on the historical development of the countries without in-depth statistical analysis. Therefore, there is potential for a statistical approach that includes variables elucidating aspects of Taiwan's political sensitivity in the context of China-U.S. relations.

Moreover, spatial econometric analysis is relevant as it reveals how Taiwan's closer ties with the United States affect the island's investment and trade strategies with China. Essentially, Taiwanese investments in China and business risks are negatively correlated, indicating that Taiwan's investments have been influenced by the overall economic relations between the two nations, particularly amidst heightened tensions in recent years (GOMES, LIMA, et al., 2019). This dynamic also impacts business strategies for companies based in Taiwan.

Thus, the aim of this research project is to examine and evaluate the levels of tension among the United States, China, and Taiwan between 2012 and 2022, as well as the reasons behind the escalation of tensions during these periods, addressing both security and economic relations.

Finally, the research project intends to explore the following themes: the economic relationships among China, Taiwan, and the United States. The objective is to ascertain the extent to which the Chinese government is willing to employ political or economic force for the reunification of both sides of the Taiwan Strait and to analyze the posture of American policies toward both Chinese and Taiwanese entities.

2 THE ADVANCEMENT OF INTERNATIONAL ECONOMY AMONG CHINA, UNITED STATES, AND TAIWAN

This chapter will discuss Taiwan's foreign trade posture and the economic effects of its non-adherence to the ASEAN Agreement, which may impact the island's economy.

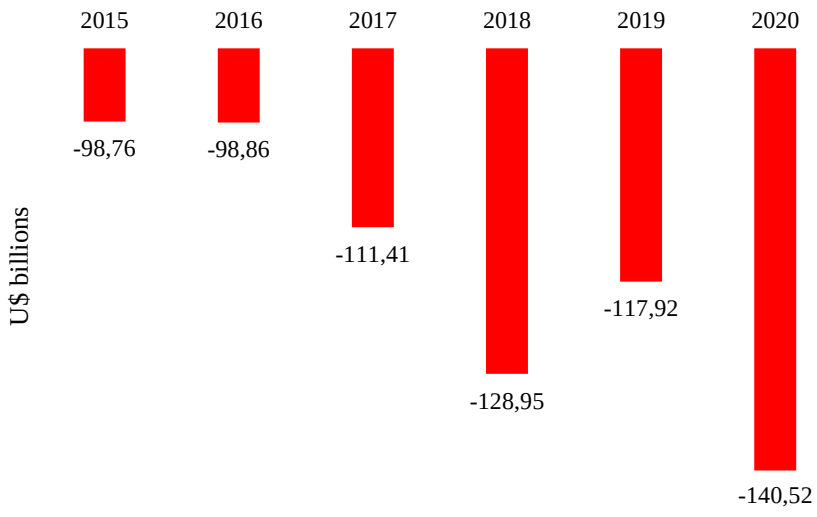
Subsequently, given that China is willing to adopt a hostile stance toward Taiwan to realize its dream of national rejuvenation, a spatial econometric analysis will be conducted to investigate the extent to which Taiwanese investments in Chinese trade have been declining, potentially in response to the aggression Taiwan has been experiencing from China.

2.1 Taiwan's Foreign Trade: Dependence on China or the United States and the Effects of the ASEAN Agreement from the Perspective of Krugman's Trade Policy

It is evident that the study cannot rely solely on a single political approach to understand the tensions among China, the United States, and Taiwan. Thus, Hsu, Hsu, and He (2021) argue that the complexity of relations across the Taiwan Strait cannot be represented only from a political or security viewpoint; it also necessitates an international economic approach.

Initially, Taiwan's international trade is closely intertwined with both the United States and China, primarily comprising industrial goods. China accounts for over $82 billion, while the United States contributes approximately $40 billion to Taiwan's foreign trade (MA, 2022). From 2013 to 2021, China represented 24% and the United States 12% of Taiwan's total trade (BUREAU OF TRADE, 2022). However, from 2015 to 2020, China recorded a trade deficit of over $140 billion with Taiwan (FIGURE 1).

Figure 1: Trade Balance between China and Taiwan from 2015 to 2020 (in billions of dollars)



Source: Ma (2021).

This illustrates the extent to which Taiwan's trade is linked to one of the world's major economies. Based on data from UN Comtrade, 62% of the total trade volume between the United States and Taiwan consisted of imports from the island state in 2021. Most of these goods fall within the IT and electronics sector, with companies like Apple, Qualcomm, and NVIDIA relying on chips manufactured in Taiwan's large-scale semiconductor foundries (ZANDT, 2022). This fact further underscores the strong association between Taiwan's trade and that of the United States, despite Taiwan's policy of producing industrial goods domestically (KING, 2022).

The phrase "producing for the Americans," mentioned in Joe Biden's State of the Union address regarding the international market in early March 2022, highlights complications in the relationships involving China and Taiwan, given that a significant portion of American industry operates on both continents (U.S. DEPARTMENT OF STATE, 2022). Biden's remarks suggest that the U.S. government intends to gradually focus on "friendshoring," relocating production to countries that align with its policies while producing in its own region. For instance, Macy's announced plans to move its production outside of China (BHATTACHARYYA, 2018). Similarly, Intel plans to invest $20 billion in chip manufacturing centers around Columbus, aiming to establish the largest semiconductor production site globally, surpassing Taiwan (KING, 2022). Consequently, foreign trade among these nations will be affected.

Another crucial factor in international trade, particularly between China and Taiwan, pertains to import tariffs. The "ASEAN + 1" Agreement, or ASEAN (Association of Southeast Asian Nations), signed on January 1, 2010, aimed to eliminate or reduce import tariffs for member countries to China, covering over 90% of traded products (FEDDERSEN, 2020). In addition to discussions about the potential "ASEAN + 3" agreement, which would incorporate Japan and South Korea into this free trade zone, Taiwan remains excluded from the Agreement. According to Chou (2010):

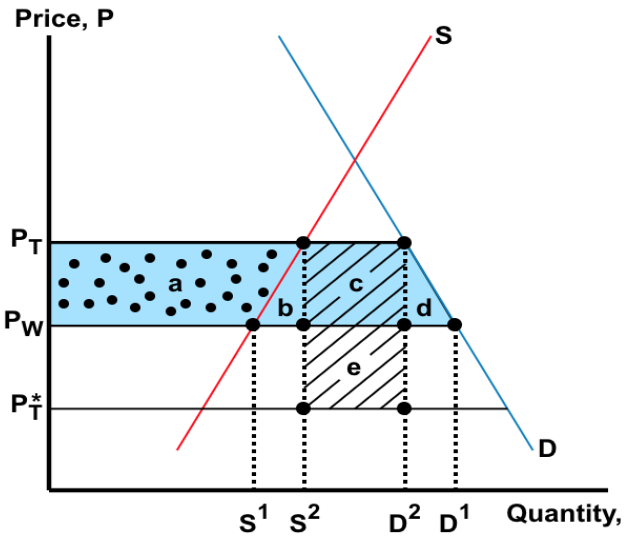
> *The ASEAN + 1 and ASEAN + 3 arrangements prevent Taiwan's businesses from competing effectively in the Asian market, causing its eventual marginalization in the region. In 2010, while most ASEAN goods gain tariff-free access to the Chinese market, most Taiwanese imports into China will still be subject to a 6–14% tariff. Consequently, Taiwanese businesses will be forced to leave China and invest elsewhere to avoid this disadvantage. If allowed to snowball, this problem would hollow out Taiwanese industries and severely damage Taiwan's competitiveness. With decreased capacity, Taiwan will no longer play an important role in the Asian economy, and will appear as "the wallflower in China's dance with regional trade*

partners." Making matters worse, South Korea, one of the "Plus Three" countries, also has an export-heavy economy and has become Taiwan's biggest competitor in recent years. Thus, if Taiwan cannot effectively reduce its costs, its role in the Asian economy may be slowly replaced by an ambitious South Korea, which enjoys open access to China and ASEAN member countries. On the other hand, if Taiwan does successfully negotiate the ECFA and therefore levels the playing field, studies show that foreign investments in Taiwan can increase from 29 –42%. Should Taiwan also manage to negotiate free trade arrangements with ASEAN, its foreign and domestic investments are projected to increase another 23–37% (CHOU, 2010).

In other words, Chou (2010) indicates that the Agreement is economically unfavorable for Taiwan, as the country will not participate in the free trade zone and thus will not benefit from reductions in import prices. Consequently, the absence of tariff reductions on the island, coupled with potential increases, will have a cascading effect on Taiwan's economy and trade (KRUGMAN, OBSTFELD, and MELITZ, 2015).

For instance, since Taiwan would not gain the advantage of the free trade zone by eliminating its import tariffs, it is likely to experience price increases on various goods. According to Krugman (2015), Taiwan could face rising production costs, a greater loss of consumer welfare, increased customs revenue, and heightened protection for Taiwanese semiconductor producers. However, this situation would also result in a significant loss of competitiveness for exporters of various goods to Taiwan (FIGURE 2).

Figure 2: The costs and benefits for different groups can be represented as the sum of the five areas a, b, c, d, e.



Source: Krugman, Obstfeld, and Melitz (2015).

Thus, the areas of the two triangles, b and d, represent the loss for the nation as a whole (efficiency loss), while the area of rectangle e measures a compensatory gain (terms-of-trade gain). The efficiency loss arises because a tariff distorts consumption and production incentives (KRUGMAN, OBSTFELD, and MELITZ, 2015). Producers and consumers behave as if imports are more expensive than they actually are. Triangle b represents the distortion loss from production, while triangle d represents the distortion loss from consumption (KRUGMAN, OBSTFELD, and MELITZ, 2015). The terms-of-trade gain occurs because a tariff lowers export prices to foreign markets.

In summary, with Taiwan's non-participation in the ASEAN free trade zone, the tariff raises the domestic price from Pw to Pt while reducing the foreign export price from Pw to P't. Consequently, national production accelerates from S1 to S2, while consumption contracts from D1 to D2. The costs and benefits for different groups can be expressed as the sum of the areas of five regions, designated as a, b, c, d, and e (KRUGMAN, OBSTFELD, and MELITZ, 2015).

A simple way to conceptualize these gains and losses for Taiwan, according to Krugman, Obstfeld, and Melitz (2015), is as follows:

> "The triangles symbolize the efficiency loss that arises because a customs tariff distorts incentives to consume and produce, while the rectangle represents the gains from trade that arise because the customs tariff reduces foreign export prices. The gain depends on the country's ability to impose a tariff to lower foreign export prices. If the country cannot affect world prices, the region e, which represents the gains from trade, disappears, and it becomes evident that the customs tariff reduces welfare" (KRUGMAN, OBSTFELD, and MELITZ, 2015).

In other words, the customs tariff increases the domestic price while reducing the price in the foreign market. When a country is relatively small in global GDP terms, as Taiwan is, the prices of imports for industrial or agricultural goods will increase (from Pw to Pt), and the quantity demanded for imports will decrease (from D1 to D2).

The customs tariff raises the price of goods in the importing country while lowering the price in the exporting country. As a result, consumers lose in the importing country while exporters gain. In other words, prices will rise for consumers in Taiwan, which, not having its import tariffs eliminated due to non-participation in ASEAN, will experience a reduction in consumption and an increase in national production. Therefore, producers tend to gain more in the importing country than in the exporting country.

Additionally, the government benefits from revenue generated by the imposition of a customs tariff. Krugman, Obstfeld, and Melitz (2015) confirm this hypothesis:

> "The customs tariff distorts incentives for both producers and consumers, inducing them to act as if imports are more expensive than they truly are. The cost of an additional unit of consumption for the economy is the price of an additional unit of import. Since the customs tariff raises the national price above the world price, consumers reduce their consumption to the point where the marginal utility equals the national price inclusive of the tariff. This implies that the value of an additional unit of domestic production for the economy is the price of the unit of import that it saves, even as domestic producers expand production until the marginal cost equals the price inclusive of the tariff. Thus, the economy produces additional units of goods that could be purchased more cheaply from abroad" (KRUGMAN, OBSTFELD, and MELITZ, 2015).

Therefore, Taiwan will experience producer surplus and government revenue, accompanied by disincentives for consumers and a significant loss of competitiveness in exports and integration into the international market (KRUGMAN, OBSTFELD, and MELITZ, 2015) (TABLE 1). This also indicates that the ASEAN Agreement may further reduce Taiwan's participation in international affairs.

Table 1: Summary of the effects of international trade policies

Policy	Import Tariff (Customs)	Export Subsidy	Import Quota	Voluntary Export Restriction
Producer Surplus	Increases	Increases	Increases	Increases
Consumer Surplus	Decreases	Decreases	Decreases	Decreases
Government Revenue	Increases	Decreases (government spending increases)	No Change (leases to license holders)	No Change (leases to foreigners)
Welfare	(Ambiguous) decreases for small countries	Decreases	(Ambiguous) decreases for small countries	Decreases

Source: Krugman, Obstfeld, and Melitz (2015).

Finally, even though the United States is involving Taiwan in trade and international affairs, it is observed that in the coming decades, the island may not maintain as strong a trade connection with the United States due to American investments in semiconductor chip production in Columbus (KING, 2022). Meanwhile, China is increasingly attempting to isolate Taiwan from regional trade and the rest of the world

(FEDDERSEN, 2020). One possible response from Taiwan is to reduce its investments in mainland China, as there is a notable lack of significant correlation in some regions regarding Taiwanese investments in Chinese trade.

2.2 Spatial Econometric Modeling and the Trade Relationship between China and Taiwan

As the correlation matrix test and the logistic model's dichotomous probability were conducted, Xi Jinping's more aggressive stance toward Taiwan is linked to the country's economic growth and China's percentage participation in the island's economy (PIETRAFESA and SILVA, 2019). Given that China aims to increase Taiwan's dependence on Chinese trade, the logistic values obtained indicate the extent to which Taiwanese individuals may exhibit hostility towards the Chinese. Consequently, the likelihood of Taiwan's diplomatic actions being hostile when Chinese diplomacy is aggressive is 53.10 times greater than the chance of Taiwan responding hostilely when the Chinese approach is more cooperative (PIETRAFESA and SILVA, 2019). The analysis suggests that if Xi Jinping continues to pressure the Taiwanese government for hostile actions, the response is likely not to align with China's expectations.

Based on this data, another crucial measure is conducting econometric modeling to investigate how Taiwanese commercial and investment postures have changed over the past two decades in relation to China, particularly under Tsai Ing-wen's administration, which has shown increased affinity towards the West (TIAN and LEE, 2020).

The Moran index aids in identifying the impact factors of Taiwan's investment strategy in mainland China over the last 20 years, revealing characteristics of uneven distribution across eastern, central, and western regions.

Firstly, Moran's I is applied to determine whether spatial heterogeneity exists. Moran's I has a significant advantage in studying the relevance of spatial variables. It reflects the degree of similarity between the properties of unit attribute values in adjacent regions to analyze the spatial autocorrelation coefficient among the variables (GOMES, LIMA, et al., 2019).

In general, the selection criterion is that I falls within the range of -1 ≤ I ≤ 1 (LUZARDO, FILHO, and RUBIM, 2017). When the economic behavior of two regions is positively correlated, I is positive. Conversely, when the behavior is negatively correlated, I is negative. If I equals 0, the economies of these two regions are independent. The use of global and local Moran indices can reveal the spatial correlation of the global region and its surrounding area (BALTAGI, 2009).

The spatial correlation test primarily relies on the hypothesis testing of maximum likelihood estimation through Wald, LR, and LM statistics, along with Moran's spatial correlation index and Geary's C (BALTAGI, 2009). Consequently, this research project adopts Moran's I to measure the spatial distribution of Taiwan's investments in mainland China over the past 20 years, utilizing the block matrix $C = I_t \otimes W_n$ as a spatial weight matrix.

The spatial panel data model is divided into a spatial lag model and a spatial error model. The LMerr and LMsar tests provide a stable assessment of spatial correlation and can help define the model, identifying the selectivity of the spatial lag model and the spatial error model. If LMsar (LMerr) is more significant than LMerr (LMsar), then the spatial lag model (spatial error model) is deemed appropriate (ALVES, 2017). This study found LMerr (0.2144) > LMsar (0.0742), indicating that the spatial error model was more suitable than the spatial lag model. Based on the global spatial correlation, the spatial autoregressive model demonstrated that all explanatory variables of a region's economic growth influence other areas through a spatial transmission mechanism. The spatial error model indicates that the impact of regional repercussions arises from random shocks. The adopted spatial error model (SEM) is as follows:

$$y = X'\beta + \mu$$

$$\mu = \lambda(I_t \otimes W_n)\mu + \varepsilon$$

Y represents the dependent variable, X is considered the vector of independent variables (including a constant term), β denotes the coefficient variable, p and λ are spatial autocorrelation coefficients, and ε is the error component. In the unidimensional error decomposition model, $\varepsilon = n_i + v_{it}$ or $\varepsilon = \delta_i + v_{it}$;in the bidimensional error decomposition model, $\varepsilon = n + \delta_t + v_{it}$, $n_i \sim IID(0, \omega_i^2)$, $\delta_t \sim IID(0, \xi_t^2)$ and $v_{ti} \sim IID(0, \sigma_{ti}^2)$... t, i represent the temporal and cross-sectional dimensions, respectively.

I_t is the T-dimensional unit matrix, and W_n is the n × n spatial weight matrix (where n denotes the number of regions). Thus, this framework allows for the determination of spatial weight matrices and identifies factors that may influence Taiwan's investments in mainland China.

This research project will utilize spatial panel data to analyze the investment patterns of Taiwan in China. According to the geographical distribution of Taiwanese investments in China, published by the Investment Commission of Taiwan's Ministry of Economic Affairs, 21 provinces in mainland China, which are autonomous regions, have been selected as statistical samples (ALVES, 2017). These provinces include Heilongjiang, Jilin, Liaoning, Hebei, Beijing, Shanxi, Tianjin, Shandong, Jiangsu, Anhui, Sichuan, Hubei, Chongqing, Shanghai, Zhejiang, Hunan, Jiangxi, Yunnan, Fujian, Guangdong, and Guangxi. The K-nearest neighbor (KNN) algorithm was utilized as an independent variable to estimate the results of the Moran's I index test, based on the previously mentioned spatial weight matrix (TABLE 2).

Table 2: Regional Impact Factors of Taiwan's Investment in Mainland China

Independent Variables		Abbr.
Investment Environment	Geography	ENVI
	Infrastructure	INFR
	Social Environment	SOEN
	Legal Environment	LAWE
	Economic Environment	ECEN
	Market Environment	MARKE
	Innovation Environment	INEN
Investment Risks	Social Risk	SORI
	Legal Risk	LARI
	Operational Risk	MARI
	Economic Risk	ECRI
Level of Appreciation of Taiwan	Level of Investment Preference in Taiwan	RECO

Source: Adapted by the author.

According to Taiwan's annual TEEMA report, the factors affecting Taiwanese investments in mainland China during 2008, 2009, and 2010 included twelve indices (TABLE 2): geography, infrastructure, social environment, legal environment, economic environment, market or business environment, innovation environment, social risk, legal risk, operational risk, economic risk, and the level of appreciation of Taiwan. This indicates the degree of preference among Taiwanese entrepreneurs in recommending mainland China to other Taiwanese investors as regions for investment.

Data were obtained through an independent evaluation of the sample data, rather than actual economic data, which necessitated the independence of these variables (TABLE 3) However, the data derived from the multicollinearity test of the model showed a high degree of correlation among these indices. This characteristic may increase the standard error of the regression coefficients, thereby altering both the significance level and the direction of the coefficients (ALVES, 2017). Nevertheless, the collinearity of the econometric model would not affect the magnitude of the regression coefficients. Therefore, a collinearity test is conducted to reanalyze the independent variables (BALTAGI, 2009; GOMES, LIMA, et al., 2019). Significant regression coefficients can be obtained, demonstrating the characteristics of the correlations.

Table 3: Moran's I Index Test for Provinces (1992-2010)

Years	Moran	E(I)	Z	P
1991	0.1848	-0.0500	2.3133	0.0290
1992	0.0518	-0.0500	1.5217	0.0760
1993	0.1336	-0.0500	1.9165	0.0560
1994	0.1663	-0.0500	1.8711	0.0470
1995	0.1531	-0.0500	1.6580	0.0680
1996	0.0992	-0.0500	1.2300	0.0900
1997	0.0836	-0.0500	1.5321	0.0780
1998	0.0519	-0.0500	1.0922	0.1370
1999	0.0167	-0.0500	0.6624	0.2036
2000	0.0064	-0.0500	0.5465	0.2250
2001	0.0762	-0.0500	1.1951	0.1230
2002	0.1675	-0.0500	1.9454	0.0550
2003	0.1228	-0.0500	1.5897	0.0810
2004	0.2012	-0.0500	2.3281	0.0310
2005	0.1659	-0.0500	2.1419	0.0320
2006	0.1166	-0.0500	1.7463	0.0670

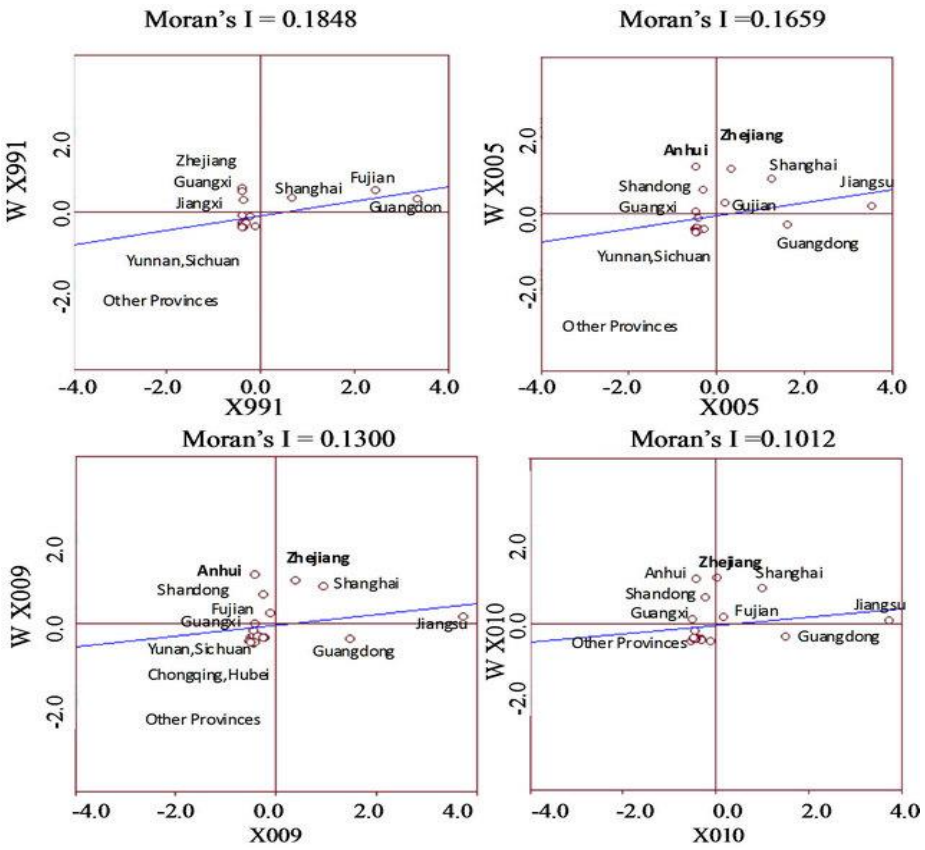
2007	0.1216	-0.0500	1.7386	0.0630
2008	0.1417	-0.0500	2.2606	0.0240
2009	0.1300	-0.0500	1.9956	0.0400
2010	0.1012	-0.0500	1.6154	0.0700

Source: Adapted by the author.

Over the total 20 years of regional investment by Taiwan in Mainland China, the characteristics of a positive spatial correlation are evident. The data from 1991, 2004, 2005, 2008, and 2009 were significant at the 5% level; while the years 1993, 1994, 2002, 2006, and 2007 were significant at the 10% level. The positive correlation for other years was not statistically significant (see Table 3).

Notably, the years 1991, 2005, and 2009 exhibit significant characteristics of spatial concentration, as well as 2010, the year the Economic Cooperation Framework Agreement (ECFA) was signed. Despite the lack of significant positive correlation in some other regions, certain areas still show favorable results. The Pearl River Delta has emerged as the primary investment region for Taiwan. Fujian, Guangdong, and Shanghai are the three main investment areas, primarily representing labor-intensive industries (see Figure 3). Taiwan's investment in these three regions shows a positive correlation in terms of spatial distribution (first quadrant).

Figure 3: Spatial Correlation Graphs of the Global Moran's I Index



Source: Adapted by the author.

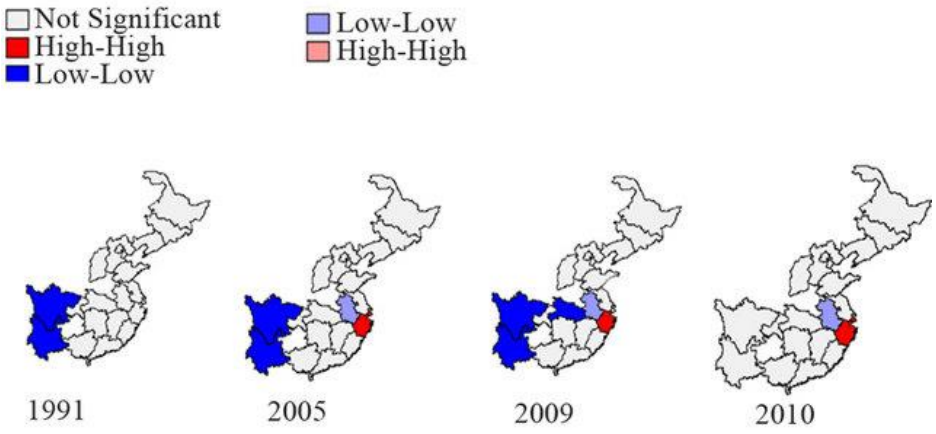
Taiwan's investment was low in the regions of Guangxi, Jiangxi, and Zhejiang, with precise geospatial distributions positively correlated with these three areas. Taiwan's investment in the remaining provinces was relatively modest. By 2005, the pattern of Taiwanese investment in China had shifted (see Figure 3). Significant positive spatial correlations were observed between Jiangsu, Shanghai, Zhejiang, and Fujian. Guangdong, which attracted a substantial volume of Taiwanese investment, exhibited a negative correlation with the surrounding provinces despite the relatively low Taiwanese investment. Shandong, Anhui, and Guangxi received minimal Taiwanese investment and displayed a negative spatial correlation.

The other provinces with low Taiwanese investment demonstrated a positive spatial correlation. In 2009, Jiangsu, Shanghai, and Zhejiang exhibited positive spatial characteristics, while Shandong, Anhui, and Fujian showed a negative spatial correlation. Guangdong, a province with strong Taiwanese investment, presented a negative correlation with adjacent areas. However, Guangxi displayed a significant spatial

independence. In 2010, the spatial heterogeneity of Taiwanese investment in China was not significant, and the spatial distribution of investments was homogeneous.

The spatial concentration graph of the Local Indicators of Spatial Association (LISA), measured using the Moran index, illustrates the distribution of Taiwanese investment since 1991 and reveals two significant characteristics (see Figure 4). First, a significant positive correlation was indicated between low-value areas in Sichuan (1% level) and Yunnan (5% level). The spatial correlation for the remaining provinces was not significant. In 2005, Anhui province and its surrounding areas exhibited a significant negative correlation (1% level). Zhejiang and its bordering regions showed a positive correlation at the 5% level. Sichuan and Yunnan displayed a low positive correlation at the 5% level. In 2009, the provinces demonstrating a low-value positive correlation (5% level) included Yunnan, Sichuan, Hubei, and Chongqing. Anhui province showed a negative correlation at the 5% level, while Zhejiang exhibited a positive correlation at the 5% level. By 2010, Anhui province displayed a low negative correlation at the 5% level, whereas Zhejiang indicated a high positive correlation at the same level. The spatial correlation for the remaining provinces was not significant.

Figure 4: Spatial Concentration of the Moran Index



Source: Adapted by the author.

Thus, Taiwan's investment in China over the past 20 years has been highest in the province of Zhejiang, which exhibited the strongest spatial correlation and greatest homogeneity with the surrounding areas. In contrast, Anhui province and its neighboring

areas demonstrated minimal spatial heterogeneity. The investment pattern of Taiwanese businesses in mainland China reveals polarization and a lack of an appropriate inter-regional cooperation mechanism, resulting in weak spatial correlation between regions (Alves, 2017). The inter-regional distribution of Taiwanese investment has not fostered a more interactive development situation between both sides of the Strait (Yeung, Gan, and Jiang, 2022).

Within this pattern of Taiwanese investments in China, significant sectors have been impacted by the island's strategic posture shift (Yeung, Gan, and Jiang, 2022). The results indicate that regional differences were not accounted for, and the most important factors in Taiwanese investment in mainland China over the past three years (2007, 2008, and 2010) include improvements in the natural environment, infrastructure, and economic risk (see Table 4) (Alves, 2017).

Table 4: Results of the General Analysis of the Panel Model

Variables	Coefficient	Std. Error	t- Statistic	Prob.
ENVI	0.437815	0.465588	0.940349	0.0372
INFR	-1.134638	0.601653	-1.885869	0.0595
SOEN	2.189960	0.485041	4.514996	0.0000
LAWE	-6.714128	0.597710	-11.23308	0.0000
ECEN	4.732710	0.400019	11.83122	0.0000
MARKE	8.004338	0.634303	12.61315	0.0000
INEN	-0.831210	0.417115	-1.992758	0.0465
SORI	2.888208	0.534176	5.406851	0.0000
LARI	-6.854205	0.750625	-9.131328	0.0000
MARI	4.887199	0.805937	6.063994	0.0000
ECRI	0.001636	0.739322	0.002213	0.0982
RECO	-3.817749	0.426538	-8.950542	0.0000
R^2	0.386220	Mean dependent var		11.79129
R^2 Ajusted	0.381071	S.D. dependent var		1.806638
S.E. Regression	1.421319	Residual sum of R^2		2648.415
Durbin Watson test	1.393557	Second Stage SSR		2648.415
Instrument Rank	13.00000			

Source: Adapted by the author.

The results indicate that several variables significantly affected Taiwanese investment in the Chinese market at the 5% level. Among these factors, the social environment, economic environment, and market environment had significantly positive

impacts. The legal environment and innovation environment exhibited significantly negative impacts. Social and market risks had significantly positive effects on investment in Taiwan, while legal risk had a significantly negative impact. The degree of preference for Taiwan also had a significantly negative effect. It can be concluded from these results that the factors that effectively promoted Taiwanese investment in mainland China over the past three years primarily include the social environment, economic environment, market environment, and reduced legal risk.

The results presented from the spatial error model with fixed effects (SEM) demonstrate that the 21 sampled areas receiving Taiwanese investment in 2008, 2009, and 2010 had effects in both the fixed spatial effects model and the temporal fixed effects model (see Table 5). The geographic environment and market environment exhibited a significant positive relationship with Taiwanese investment at the 1% level; infrastructure and the legal environment showed a significant negative correlation at the 1% level; business risk and the appreciation level of Taiwanese entrepreneurs demonstrated a significant negative correlation at the 5% level.

Table 5: Fixed-effect spatial error model (SEM)

Variables	Coefficient			
	Model 1	Model 2	Model 3	Model 4
Intercepts	11.7995			
ENVI	1.3662	2.441638***	1.947974	2.946701***
INFR	-2.1184	-4.711658***	-2.075676	-5.252975***
SOEN	3.0410	1.912495*	3.760813*	1.856820*
LAWE	-7.4177***	-4.003429***	-8.309495***	-4.377563***
ECEN	4.5272**	0.969862	4.874697***	0.843587
MARKE	7.1753**	4.465349***	6.916222**	5.001891***
INEN	-1.2589	-2.188730**	-1.527832	-2.250578**
SORI	1.7089	0.783276	1.417288	1.431297
LARI	-6.6332**	-0.882737	-7.455075**	-0.703268
MARI	3.3069	-4.182716*	3.404127	-5.666034**
ECRI	0.6318	1.579397	1.568447	2.009705
RECO	-4.4494**	-1.883895**	-4.853772**	-2.048145**
Spat.aut.	-0.1790	-0.210969	-0.233976*	-0.312971**
R	0.4145	0.9296	0.4075	0.9289
F	-110.08523	-43.476101	-110.68627	-44.30271
Total Time	0.4810	0.1220	0.0970	0.1140

Note: *p < 0.1; **p < 0.05; ***p < 0.01. Model 1: No fixed effects; Model 2: Spatial fixed effects; Model 3: Temporal fixed effects; Model 4: Spatial and temporal fixed effects.

Source: Adapted by the author.

The results from the spatial error model (SEM) indicated that differences in geographical and inter-regional market environments, along with gradual improvements in these factors across regions, had a significant positive impact on Taiwanese investments in mainland China over the past three years (2008, 2009, and 2010).

Conversely, disparities in inter-regional infrastructure and the legal environment significantly constrained Taiwan's regional investment strategy. The results from Model 4 suggest that business risks and the level of appreciation among Taiwanese entrepreneurs notably (at the 5% level) restricted the investment choice strategy of Taiwanese businesses in mainland China. If regional differences were not considered, the most important factors influencing Taiwanese investments in mainland China over the past three years—such as the social environment, economic environment, market environment, social risk, and market risk—could have had significantly greater positive impacts. Conversely, the legal environment, innovation environment, legal risk, and the level of appreciation among Taiwanese entrepreneurs had significantly negative effects on investment in Taiwan.

In simple terms, Taiwan's major political events have influenced the convenience of investment in China, with a more democratic government returning to power, gradually diminishing the positive messaging favoring economic interaction across the Strait (Ma, 2021). This also affected and altered the confidence, behavioral strategies, and regional distribution of Taiwanese investments in mainland China.

The lingering question remains: even as Taiwan may be investing more in certain Chinese areas or regions, while others experience reduced investments amidst China's increasingly hostile behavior towards Taiwan—stemming from beliefs of sovereignty over the Strait—will China indeed invade Taiwan? Moreover, will the United States protect Taiwan? In this conflict, what may be more critical: political or economic considerations? Given that Taiwan is economically intertwined with both China and the United States, as evidenced by a gradual decline in its investments in mainland China over the past 20 years (Pietrafesa and Silva, 2019; Ma, 2021).

3 WILL CHINA INVADE TAIWAN? WILL THE AMERICANS PROTECT THE ISLAND? WILL POLITICS OR ECONOMICS PREVAIL IN THIS CONFLICT?

Following the qualitative and statistical discussion, it appears that China is increasingly close to launching an offensive against Taiwan. From this perspective, several motivations can be identified regarding a potential Chinese invasion of the island:

- The **Westernization of Taiwan** is a significant factor. As previously discussed, relations between Taipei and Beijing have become increasingly tense since the election of President Tsai Ing-wen in January 2016. Xi Jinping perceives the new democratic government in Taiwan, which aligns more closely with American policies and distances itself from the One China policy, as a threat to the stability of both sides of the Strait and the dream of national rejuvenation in China. This is in stark contrast to the era of Ma Ying-jeou, who, despite adopting the One China policy, had high levels of military procurement from the United States, thereby modernizing Taiwan's military as a means of self-defense against China.

- The **military modernization of Taiwan** poses an ongoing challenge to Chinese aspirations. The continuous export of U.S. arms to Taiwan has bolstered the Taiwanese public's sentiment towards independence, enhancing their desire to assert sovereignty in the region. This military support serves as a countermeasure to China's national rejuvenation policy.

- President **Tsai's opposition to the One China policy** complicates matters further. She refuses to recognize the 1992 Consensus, which asserts that both Taiwan and the mainland are part of "one China." Tsai maintains that the Taiwanese should be considered an independent state, which eliminates the need for a formal declaration of independence. Her efforts to seek greater international recognition align with the sentiments of the Taiwanese populace, a majority of whom do not support the idea of both sides of the Strait belonging to "one China." Furthermore, her administration has worked to enhance American presence on the island, with notable visits from high-ranking U.S. officials, showcasing strong support for Taiwan's democratic government.

- The **support from the West for Taiwan** remains crucial. The primary priority for Americans in the event of a Chinese invasion would be to support Taiwan, a trend

that has persisted for decades. Western backing manifests through military modernization, increased international engagement for Taiwan, and public support against Chinese aggression. However, should China seize Taiwan, it could unleash significant military resources to protect itself against a potential American invasion, escalating the conflict's costs and potentially dissuading U.S. intervention despite strong declarations of military support for Taiwan.

- There is a noticeable **reduction in China's economic share in Taiwan**. Despite ongoing American support, Taiwan remains economically dependent on China, which is its largest trading partner. The refusal of Tsai to adopt the One China policy indicates Taiwan's gradual attempt to decouple its economy from China. For instance, there was a symbolic decrease in China's market share in Taiwan from 2017 to 2019. This trend highlights a shift, even though China had previously increased its economic influence in Taiwan significantly from 2000 to 2008.

- Lastly, there is a **decline in Taiwanese investments in China**. The investments made by Taiwan in mainland China are negatively correlated with commercial risks, illustrating that economic and political relations between the two countries have influenced Taiwan's investment strategies. The rising tensions, whether political or economic, have altered Taiwanese behavioral strategies and regional investment distribution.

In conclusion, despite the outlined motivations, it remains difficult to estimate the likelihood of a short-term invasion of Taiwan, as China stands to lose more than it gains from such a conflict. For example, given China's extensive trade ties with countries like Japan and Korea, which have strong Western influence, retaliatory actions against China could result in severe economic difficulties. Furthermore, American military cooperation with Western-aligned states in Asia could hinder Chinese advances against Taiwan, significantly increasing the costs of any military conflict.

While the aggressive postures of Xi Jinping toward Taiwan are evident, and the Chinese state's doctrine often emphasizes the use of force, it remains uncertain if Taiwan will continue Tsai's policies in the long term. If so, the possibility of a forced invasion by China may become more pronounced in the future.

4 FINAL CONSIDERATIONS

This research project examined the levels of tensions—both in security and economic and econometric terms—among the United States, China, and Taiwan. The empirical studies showed divergent results on this topic. The project's findings clearly indicated that the United States (U.S.) has maintained a dual alignment policy with both sides of the Taiwan Strait since the Obama administration. Furthermore, China is motivated to use force to achieve reunification with Taiwan if it continues to delve deeper into Western politics (Huang, 2017).

These observations have important implications for the Chinese offensive in the region and for the United States. The U.S. commitment to Taiwan's security, particularly the continuation of arms sales to Taiwan, represents one of the main sources of tension in the broader Sino-American relationship. In recent years, analysts in both Washington and Beijing have proposed new approaches to the issue (Haass & Sacks, 2020). In the United States, some have suggested that the country should cease arms sales to Taiwan and consider withdrawing its commitment to the island more broadly. In the People's Republic of China (PRC), some have suggested that a rising China should adopt a harder line in response to U.S. arms sales (Haass & Sacks, 2020).

It is evident that both proposed political alterations carry significant risks. In the case of the U.S., ending arms sales or trade relations with Taiwan could increase the likelihood of conflict in the Strait, shifting relations between the two sides from a deterrence dynamic to a competition dynamic (Lee & Siu, 2019). In the Chinese case, a tougher approach to U.S. arms sales and trade could have the opposite effect, revealing a stronger U.S. commitment to Taiwan's security than might currently be assumed (Panda, 2019).

In other words, Taiwan's increasing proximity to the United States (the West) infuriates the Chinese, who attempt to isolate the island from the rest of the world (Wenzhao, 2017). The dream of national rejuvenation involves unification with the island, and no power will separate both sides of the Strait (Silk, 2013; Xinhua, 2014).

Finally, the research project demonstrates that although the United States is attempting to integrate Taiwan into more international affairs—whether political, security, or trade (Wang, 2020)—China remains steadfast in its stance and considers an

offensive against the rebellious island. To achieve the Chinese dream, reunification with the rebellious society, namely Taiwan, must come first (Huang, 2017).

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