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Taiwan's Import Protection after Acceding to the WTO

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Abstract

During its significant democratic transition, Taiwan has obtained WTO membership in 2002 in order to escape from its recent international protectionism and diplomatic isolation. In the dimension of public policy-making, Taiwan's trade policy needs not only are consistent with existing WTO rules but also reveal the outcomes of competition among domestic common interest groups.

The question posed at the outset of this study is whether the decisive role of the state in formulating trade policy is now strongly influenced by common interest groups. In an effort to investigate this issue, this study undertakes a case study comparison of the formulation of Taiwan's tariff and non-tariff measures (NTMs) during the democratic transition. The study therefore employs a political economy approach to quantitatively examine the influences of interest groups on the formation of Taiwan's trade policies in its new WTO membership regime.

Using data on Taiwan's manufacturing industry with trade protection for 2009 and 2013, this study applies a simultaneous Tobit technique to review the joint determinants of Taiwan's tariffs and NTMs with the import penetration levels.

As shown in the empirical evidence of the study, Taiwan's tariffs and NTMs are complementary in setting trade protection in both 2009 and 2013, which in turn suggests that Taiwan's trade policies have been subject to the constraints of international agreements and pressure from international interest groups, especially in the formation of Taiwan's tariffs, rather than the establishment of import restrictions.

The empirical results also reflect a case where after joining the WTO, Taiwan's trade protection regime has been, to a significant extent, influenced by the domestic common interest groups. In Taiwan's newly democratic society, private interest groups can now engage in lobbying for policies that benefit their own interests. The private sector has been actively participating in public policymaking, while the state's authoritarian power has declined.

Finally, to some extents, both tariff and NTMs are utilized to relieve industries of their difficulties. However, the antidumping duties has been more effectively adopted in Taiwan. This contingent forms of trade protection significantly replaces the role of NTMs in Taiwan. As shown in this empirical evidence, an industry with monopolistic powers tends to have trade protection with NTMs rather than tariffs in order to benefit more its own interests from import protection.

1. Introduction

The study aims to explore the determinants of Taiwan's trade protection, especially after its accession to the WTO. Drawing on Taiwan's tariffs and non-tariff measures (NTMs) for 2009 and 2013, this empirical study stresses the role played by overseas interest groups and the international norms in reshaping Taiwan's trade protection.

Taiwan successfully joined the WTO in 2001. While pursuing this membership, Taiwan took a series of trade liberalization measures including the removal of import restrictions, reducing tariff barriers, and relaxing restrictions on trade with socialist countries and China.

First of all, since 1986, Taiwan has aggressively simplified the import/export procedures and also relaxed restrictions and licensing regulations on all categories of trade goods. As a significant milestone of trade liberalization, in accordance with the Foreign Trade Law, Taiwan further has adopted a negative list in the administration of trade goods since July 1994. Only 2.45% of the 10,241 items listed under ten-digit HS codes were subject to controls and 1.5% were subject to restrictions for April 20, 2000. Importation of all other items has been fully liberalized. Taiwan also continued to take steps to ensure that licensing regulations become more transparent and uniform, in line with international guidelines.[1]

Second, in addition to removal of import restrictions, Taiwan also pursued tariff reductions before acceding to the WTO. The nominal tariff on agricultural products fell from 12.7% in 1985 to 11.77% in 1999, while the tariff on industrial goods fell from 6.11% to 2.40% over the same period.

However, few previous studies describe the overall picture regarding the structures of tariffs and nontariff measures across Taiwan's industrial sectors, and their important factors. Using a quantitative analysis and taking Taiwan as a case study, this study aims to explore how various domestic and international interest groups play an aggressive

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[1] Furthermore, since August 1988, Taiwan has gradually allowed indirect importation of both raw materials and semi-finished products from China. Moreover, the negative list for the imports has been adopted for industrial products originated from China since July 1, 1996. Up to April 2000, 5,678 agricultural and industrial items have been allowed to be imported from China, covering 55.44% of all items with ten-digit HS codes.

role in seeking preferred import protection policies in a policy neutral regime, and to further examine the relationship between tariffs and NTMs (nontariff measures). The trade protection policies associated with tariffs and nontariff measures in Taiwan are applied as a case study. This is because Taiwan used to be regarded as a developing country characterized by a scarcity of natural resources, political autocracy, and diplomatic isolation. After joining the WTO, Taiwan has improved it diplomatic isolation dramatically, moving away from over-regulation and trade disputes with its trade partners, including the U.S.

Set against the above backdrop, this analysis addresses the following important questions: First is whether the decisive role of the state in formulating a trade policy has been significantly influenced by the domestic common interest groups. The study further examines whether international pressure groups have dominated in formatting Taiwan's trade protection across industries. Third, this study examines whether the adoption of both antidumping/countervailing duties replace or complement the traditional trade policies, tariffs and NTMs in formation of Taiwan's trade protection. Finally, this study looks at whether the state takes steps to protect labor in addition to industrial development during the global economic recession.

By examining the trade protection policymaking in both 2009 and 2013, this study suggests that the domestic common interest groups may have lost out to the international pressure counterparts because of Taiwan's tendency to keep its promises in order to enter the WTO.

Furthermore, the domestic interest groups have more aggressively and effectively joined in the public decision process since Taiwan's democratic transition. The government's political insulation from business groups has ended since the 1990s, because business groups have been important economic backers for electoral campaigns. However, these domestic interest groups are unable to retain their special interest status in terms of trade protection. The international pressure groups dominate Taiwan' trade protection across industrial sectors after its accession to the WTO. Its domestic interest groups lost a significant amount of influence to their international counterparts.

More interestingly, this empirical study suggests that the traditional import protection arguments are also supported by the cross-sectional deployment of NTMs. Setting tariffs requires approval by the legislature, while executive branches have the authority to undertake NTMs. The executive branches may use NTMs swiftly to relieve an industry of pressure from import competition. Accordingly, tariffs across industries are more stable than NTMs.

From the perspective of political economy, NTMs seem lower political costs than tariffs in helping the gainers from trade protections. This may be because NTMs are less transparent than tariffs in terms of protective measures, and the losers from protection policies can immediately be discernible in the NTMs (Hillman 1989). Cross-sector tariffs should be more suitable in demonstrating the competitively protective equilibrium among various interest groups in terms of protection gains and costs, since the information asymmetry problem may be more minor than that for NTMs.

The remainder of this study is organized as follows. Section 2 briefly outlines the views on issues surrounding the determinants of import protection. The evolution of Taiwan's trade policies over recent years after its accession to the WTO is described in Section 3. Section 4 presents an import protection model. The model incorporates a tariff equation and a non-tariff barrier equation. A Tobit model with a seemingly unrelated approach is applied for estimation. The empirical results are discussed in Section 5, while section 6 presents the conclusions drawn from this analysis.

2. The Formation of Trade Protection

One important implication of the political economy approach to analyzing protectionism is the recognition of the existence of asymmetry between those who demand protection and those who are anti-protectionist. This asymmetry biases the political market in favor of protectionism. This is demonstrated in a substantial literature on this issue. Baldwin (1984), Quibria (1989), Hillman (1989), Marks and McArthur (1993), Magee, Brock et al. (1989), Rodrik (1995), Magee and Magee (2010), and Krishna and Mitra (2016) provide comprehensive surveys of endogenous trade protection and trade liberalization.

In a market-oriented regime, the private sector, consisting of private firms and individuals, is regarded as the seeker of trade protection policies. They pursue their preferred trade policies by lobbying (Olson 1965, Olson 1982, Chang 1987, Grossman and Helpman 1994, Hall and Deardorff 2006) and by voting (Caves 1976, Mayer 1984, Mayer and Li 1994, Fordham and McKeown 2003). A government is viewed as "intermediates that balance the conflicting interests of various groups in a society in order to maximize their likelihood of remaining in power" (Baldwin 1984). The interest group model assumes that in a market economy, the private sector, which is regarded as a rent-seeking group, lobbies for favorable public policies, and in so doing individual common interest groups compete with each other in the policy market. Thus, the formation of public policy comes from the equilibrium that results from the lobby competition in "policy markets." In this sense, the government should be nothing more than an institution to implement public policy, and its policy preferences should be neutral. The foregoing viewpoint enables us to understand the formation of public policy in a market regime. The foregoing arguments explore the demand side of policy making. In some approaches (Grossman and Helpman 1994), politicians have been assumed not to seek political support to win elections, but as directly to extract rents by "selling protection."

Some studies have examined Taiwan's trade protection regime from a political-economic perspective. Within a political economy framework, Baldwin, Chen et al. (1995) focus on the trade relationship between the U.S. and Taiwan. In examining the determinants of import protection in Taiwan, Chang (1987), and (Chen and Hou 1993) applied two types of political economy model, namely the interest group model and the national policy model. Their work compares both models in understanding the formation of import protection and the structure of tariffs and NTMs across industries in 1981 and 1986. Chang (1987) argues that the national policy model is more useful than the interest group model in explaining the formation of trade barriers, after considering the fact that Taiwan was not a democratic-liberal system in the 1980s. Chen and Hou (1993) argues that the interest group model is also important in explaining import protection, and SOEs are considered a type of special interest group, as well. Neither

Chang (1987) nor Chen and Hou (1993) suggest that private interest groups represented by a seller concentration ratio can provide a significant explanation for import protection. As discussed in both studies, NTMs were adopted in the 1980s in order to protect industries without sufficient tariff barrier protection. It also implies that the government can discretely apply tariffs or NTMs as import protection.

In investigating the formation of Taiwan's nominal and effective protection across manufacturing industries in the 1980s, Smith (1998) jointly applies the interest group model and the national policy model to examine the availability of government intervention. Smith (1998) argues that the government's motivation behind providing protection for Taiwan's manufacturing industries was not to help develop industries that would be internationally competitive in the future. Rather, the protection was designed to assist industries with declining comparative advantage, implying that the interest group model (the neoclassical perspective) is more suitable than the national policy model (Amsden's (1992) perspective) in describing the formation of Taiwan's assistance policy in the 1980s. However, her study ignores the importance of SOEs in the policy-making and the distinctive properties between tariffs and NTMs.

As shown in Chang, Chen, and Hou's studies surrounding Taiwan's trade protections, it was an exogenous government that independently formulated industrial policy in the 1980s. The government had relatively strong powers of policy formulation at that time, enabling it to undertake policies against only marginal opposition. Since the democratic transition at the end of the 1980s, much has changed; various domestic interest groups and sectional pressure groups have found some ways to influence public policy making, either through lobbying or trade negotiation. Despite radical changes in its political environment, it is still worth considering whether or not the policy making in Taiwan has actually shifted to the Western-type democratic regime.

3. Trade Policy in Taiwan

Trade policy has been of special importance to Taiwan for several reasons after WII. First of all, Taiwan's foreign trade to GNP ratio is large and has grown rapidly. As shown in Table 1, Taiwan's export tendency was under 10% before 1960. Taiwan's

economy moved into the export-orientation period between 1962-1980. By 1980, Taiwan started its early industrialization and also joined the international market aggressively by pioneering the "export process zone." Its export tendency jumped from 6.3% in 1955 to 47% in 1980. The Taiwanese economy further shifted into a liberalization period between 1980-2000. The trade talks with the U.S. and the pursuit of GATT/WTO membership led Taiwan's trade liberalization. In the 1980s, Taiwan's export tendency expanded from 43%-51%, but it decreased from 36%-40% in the 1990s. In the 2000s, Taiwan successfully became a member of the WTO, and started its economic globalization period. Taiwan's economic growth now more heavily relies on its exports. Taiwan's export tendency has expanded above 50% since 2000. Few economies depend on external trade as heavily as Taiwan does.

Taiwan's major trading partners for recent decades have been China (with Hong Kong), the USA, and Japan. In terms of exports, the share of Taiwan's exports to the U.S. as a percentage of total exports increased to around 20% in the 1960s, as can be seen from Table 2, and reached 48.8% in 1984. Thereafter, it began to decrease, due partly to the increase in Taiwan's outward foreign direct investment as induced by the huge appreciation of the local currency in 1986. In 1990s, the share of Taiwan's exports to the U.S. was around 23%-30%; for 2001-2016, the share further decreased to around 10%-22%. The Japanese share of Taiwan's total exports was about 40% in the 1950s, declining to around 10% in the 1980s and 1990s. In the 2000s, the share of Taiwan's exports to Japan decreased to around 6%-10%.

In terms of Taiwan's imports, the Japanese share was over 30% over the period of 1952-1993. The U.S. share of Taiwan's imports was above 40% in the 1950s, but declined gradually to just over 20% in the 1980s. By 1997, it had fallen to below 20%. Apart from 2011 and 2012, the share of Taiwan's imports from the U.S. has been around 10%-20% since 2000.

Taiwan's trade with both China and ASEAN are generally driven by its ventures overseas. The cross-strait relations have become warmer in trade and FDI since around 1989-1990. Taiwan removed the ban on Taiwanese inhabitants visiting China in 1987.

Since then, Taiwanese started to make FDI in China. After the Asian financial crisis, Taiwan ventured into China more aggressively. According to the Investment Commission, MOEA, China has been the major destination of Taiwan's outbound FDI. In 2001, according to Investment Commission statistics, only 22% went to the developed nations (with less than 1% going to Europe). In general, Taiwan's FDI mainly goes toward China: around 40%. After China and Taiwan joined the WTO, their cross-strait FDI relationship has becomes more normalized.

Moreover, Taiwan has relaxed the restrictions on trans-shipped imports from the China since 1984 and has further lifted the prohibitions on indirect commodity imports since 1989. A year later, Taiwan further removed the ban on its indirect commodity exports to China. More importantly, in 2002, Taiwan implemented the ʻWorking Agenda of Cross-Strait Trade Policy Adjustments upon WTO Accession,' to normalize cross-strait trade. That is, the cross-strait trade and FDI have shifted from an "indirect" to a "direct" mode.

The cross-strait direct shipping can be regarded as a critical factor in cross-strait trade. The following reciprocal opening measures on cross-strait shipping have also made great progress due to the successful implementation of the "Offshore Shipping Center" in 1995. Through the mutual steps to open trade across the Straits, cross-strait shipping has changed from "prohibited" to "indirect" mode. Taiwan further implemented ʻProactive Measures for Facilitating Cross-Strait Freight Transport' in 2003. Since then, cross-strait shipping has improved from "indirect" to "direct" mode.

As shown in Table 2, the share of Taiwan's exports to Hong Kong and China increased from less than 10% in the 1980s to less than 25% in 2000. This share kept increasing and reached around 40% after 2007.

When a country has a disproportionately high amount of trade with few countries and is dependent on those countries for exports, a central issue in any trade negotiations may dominate the country's import protection regime. That is, the exporting country's bargaining position with its trading partners may be weak because of its high trade dependence. The trade talks between the U.S. and Taiwan for 1978-1980s is a typical

case. Since 1978, the U.S. has engaged Taiwan in 9 rounds of tariff concession negotiations and in other related trade negotiations. In the 1980s and 1990s, Taiwan made efforts to liberalize its economy, partly due to pressure from its main trading partners, such as the U.S., and in pursuit of WTO membership. After 2000, China has been Taiwan's largest trade partner instead of the U.S. However, China and Taiwan applied to join the WTO simultaneously, as a result of which Taiwan suffered from only minor pressure from China, in particular trade liberalization.

Tariffs

As highlighted in Table 3, before 1980, customs revenue was an important source of public income for the government. The share of tariff revenue to total tax revenue was above 20% from 1950 through 1970. It declined to less than 20% in the 1980s and has been below 10% since 1990, indicating that customs revenue has become less of a significant source of public income in Taiwan. In recent decades, tariffs have been the main means of import protection.

The average nominal tariff rate in the second column[2] remained above 30% during the first half of the 1980s. Significant import liberalization occurred only after 1985, when the average nominal tariff rate for second column countries began to fall, from 26.46% to an eventual 10.75% in 1989. Taiwan's significant tariff deduction in the 1980s can be attributed to the fact that the series of bilateral tariff negotiations between the U.S. and Taiwan, and the implementation of "the Four-Year Tariff Reduction Plan in 1989-1992", have diluted the role of international interest groups in influencing the tariff structure in Taiwan (GATT 1993).

As Taiwan had applied for accession to GATT/WTO, the average nominal tariff for the second column fell further, to below 10% during 1995–97, representing a significant reduction in tariffs over the period of the 1980s-1990s. Even after acceding to the WTO, Taiwan continued lowering tariffs. The average nominal tariff rate fell further, from 7.97% for 2001 to 5.56% for 2008.

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[2] The second column were essentially a "most favored nation status" tariff rate.

However, since the global financial crisis, Taiwan began to reshape its tariff structure. Its average nominal rate has increased from 5.71% for 2009 to 6.39% for 2018. The effective real tariff rates also exhibit a similar trend to that of nominal tariff rates. In the 1960s, these rates were in excess of 17%, but began to decline gradually in the 1970s. Effective tariff rates have been below 10% since 1980, and in the 1990s fell to below 5%. In 2000, Taiwan's effective tariff rates achieved 2.4%, a rate near the average rate of the industrialized members of the OECD, at 3.5%.

After joining the WTO, Taiwan amended its tariff schedule twice, in June 2010 and November 2012. According to the authorities, the changes in the tariff schedule mainly resulted in tariff reductions on certain products with the purpose of lowering domestic firms' input costs and therefore to enhance their market competitiveness. As a typical case, products that benefited from tariff reductions include fuels, parts and components of motor vehicles, and tube monitors.

Taiwan's tariff structure consists of ad-valorem duties, as well as specific duties and alternate duties. The ad-valorem duties remain the main tariffs, and this makes Taiwan's tariff structure more transparent. In 2013, ad-valorem rates covered 98.2% of all tariff lines. Non-ad-valorem duties are mostly concentrated in agricultural products and replace relatively high ad-valorem duties. However, there were still 150 rate bands; 86 ad-valorem; 16 specific; and 48 alternate rates. The tariffs thus remained relatively complex, involving a multiplicity of rates (Trade policy review).

In 2013, Taiwan's tariffs comprised 8,728 lines at the eight-digit level: 30.2% of all tariff lines were duty free and 52.6% of lines had rates below 10% ; 4.4% of lines were "nuisance tariffs." The simple average applied MFN tariff rate, including the ad-valorem equivalents (AVEs) of non-ad-valorem tariff rates, was 7.8% in 2009 and in 2013. Based on the WTO definition, the average applied rate remained at 22.1% for agriculture, and at 5.0% for nonagricultural products (**Table 4**).

NTMs (non-tariff measures)

The structure of Taiwan's direct import controls is quite complicated. Of all the NTMs, controlled imports are the most direct and also most powerful for restricting

imports. The commodities classified as controlled imports are importable by private importers but only under strict controls. In addition to controlled imports, the main type of NTMs may refer to the 'permissible imports.' The import commodities listed in this category are importable by the private sector but only with permission from certain branches of the government, with constraints imposed on the qualifications of the importers (so-called discretionary licensing), or with dependence on the country of origin (so-called source restrictions).

NTMs, imposed on some commodities to provide trade protection, are used for the causes of national security, environmental protection, sanitation and health, the maintenance of state monopolies, agricultural protection or industry restructuring. In fact, the objectives of NTMs seem quite ambiguous. In comparison with tariffs, these NTMs are regarded by many studies as a more effective type of restriction on imports. The required permission of various branches of the government for certain imports is often designed to protect the interests of import-competing industries. For example, the consent of the Council of Agriculture is necessary for imports of certain agricultural commodities, and the consent of the Industrial Development Bureau (IDB) is necessary for imports of certain industrial products. Once, in the late 1980s, imports of certain types of steel needed the consent of the China Steel Corporation, an important state-owned enterprise. This type of import restriction was obviously designed to protect China Steel from import competition.

Furthermore, the motivations for import restrictions based on an import's country of origin vary widely. Such measures may be designed to address trade imbalances (e.g. restrictions on importation from Japan, with which Taiwan has suffered large trade deficits in the 1980s-1990s). Such import restriction measures may also be designed to support diplomatic policies. As a typical case, the imports of coffee are restricted to some Latin American countries with which Taiwan shares a strong diplomatic relationship. Table 3 shows the evolution of various import restrictions based on the country of origin from 1989 to 1997. The main commodity items classified under this import restriction are fruits, meats, and transportation equipment. The countries most

affected by this type of import restriction are the U.S., Japan, and European nations, which are Taiwan's primary trading partners. Changes in 1997 to import restrictions based on country of origin demonstrate that such import restrictions have been vehicles for implementing the bilateral trade agreements between Taiwan and WTO members. Most of the commodities reclassified under restrictions on country of origin used to be subject to discretionary regulations. For example, coconuts were only importable subject to the approval of the Council of Agriculture, the Executive Yuan. In exchange for the Philippines', Thailand's and Malaysia's support for its accession to the WTO, Taiwan has reclassified coconuts into the restriction based on the country of origin. Generally in the 1990s, this import restriction measure has been more of a diplomatic tool than a deliberate trade policy adopted to rebalance the trade deficit.

In Taiwan, regarded as a type of trade policy, tariffs must be approved as a law by the legislature, the Legislative Yuan. In comparison with tariffs, NTMs are also regarded as the type of protection measure preferred by the executive branch of the government. This is because bureaucrats are authorized to use this type of protection in a highly discretionary way. However, the legislative branch must also approve any revision of the tariff schedule, including a reclassification of import items into permissible and controlled categories. The imposition of the aforementioned administrative restrictions on permissible imports is the prerogative of the executive branch. In a democratic society, the state has difficulty separating itself from the influence of various interest groups in imposing trade policies, including a set of tariffs and import controls.

In this section, various NTMs can be aggregated to measure a degree of trade protection. A political economy model is established that examines Taiwan's trade protection measures in 2009 and 2013. Both tariff and non-tariff barriers across industries are incorporated in the analysis. In these two years, Taiwan's economy suffered and recovered from the global financial crisis, respectively.

Furthermore, attention should be paid to the point that discretionary licensing and source restrictions are also regarded as types of NTMs. A somewhat more detailed

classification for 2009 and 2013, for example, shows the relative significance of each category, as shown in Table 2. In both years, import licensing was the most popular NTM for regulating Taiwan's imports. Accordingly, all NTM import items fit into one of the following categories: Controlled imports; Source-of-import restrictions; Discretionary licensing restrictions; and freely importable commodities.

Antidumping and countervailing

Different from tariffs and nontariff measures, both antidumping and countervailing duties are two forms of contingent (conditional) protection. That is, the contingent protection is defined through legal rules to specify some conditions for providing trade protection legally. With regard to antidumping, domestic producers can successfully perform legal proceedings to request import duties if foreign firms can be shown to be causing injury through unfair competitive practices. The countervailing duties are also a form of contingent protection consisting of import duties to neutralize subsidies that foreign producers are shown to be receiving from their governments. However, the subsidies may be implicit within ownership of foreign competition by foreign governments. (Hillman 2003)

To promote trade globalization and liberalization, the government promulgated the Foreign Trade Act on February 5, 1993. At the same time, in order to help domestic industry to obtain relief and undertake necessary restructuring when injured as a result of imports, Article 18 of the Foreign Trade Act was enacted in accordance with Article 19 of the GATT, empowering the Ministry of Economic Affairs to establish the International Trade Commission (MOEAITC) to deal with safeguard cases, and to have the responsibility of injury investigations for antidumping (hereafter AD for short) and countervailing (hereafter CV) cases.

The main AD and CV legislation is contained in the Customs Act and the Regulations Governing the Implementation of the Imposition of Countervailing and Anti-Dumping Duties. Competence for AD/CV investigations is shared by both the Ministry of Finance (MOF) and the Ministry of Economic Affairs (MOEA). The MOF takes responsibility for AD/CV determination, whereas the MOEAITC verifies injury to

domestic industries.

There are few CV and safeguard cases but mainly some antidumping cases under investigation in Taiwan. So far, only two CV cases and also two safeguard cases have been listed under investigation. There have been 31 antidumping cases under investigation since 1995. **Figure 1** presents the time trend of all investigated AD/CV cases by the International Trade Commission under the MOEA for 1999-2018. All imported goods can be grouped into three main classifications: livelihoods & chemicals, ICT goods, and metals & machineries.

Some interesting findings may be seen from the figure. First of all, the livelihood and chemicals goods have the greatest share of reviewed cases, followed by the metals and machinery goods. By contrast, there are very few cases of cases involving information and communication technology goods, which are among the most important export goods in Taiwan. This outcome seems related to their international market competitiveness.

Second, the figure shows an interesting insight. There are two AD investigation peaks over the period of 1999-2018: 1999 and 2011, which happened just two or three years after the Asian financial crisis of 1997 and the global financial crisis of 2008, respectively.

4. The Determinants of Trade Protection

A political economy approach associated with public choice is a more suitable framework to examine the formation of public policies in developed market economies (Hillman and Ursprung 1996). This is because the state of a developed market economy provides a more or less neutral institutional and procedural framework in which various interest groups compete with each other in a "political market" to pursue their preferred public policies (Grindle 1991). In a developed economy, at least two characteristics of policy-making are high relevant to the assumptions of neoclassical political economy: First, social interest-aggregating structures tend to be strong, and these interest associations are frequently captive organizations of ruling parties. This is because the political systems in developing countries are often dominated by a single party or few

parties over a long period. Second, a large number of individual and collective demands occur at the stage of policy-making. (Meier 1990)

Political systems are mainly characterized by interest groups' activities and opportunities. Competition among groups with unequal strength exists in a developed economy. A few pressure groups cannot easily obtain large economic benefit, and many groups may each obtain relatively small benefit. That is, a political market in a democratic system is open for interest groups to compete for their preferred policies (Becker 1981). To some extent, this study empirically examines the important influence of interest groups on Taiwan's trade protection, especially after its accession to the WTO.

This study focuses on the 3-digit industry sectors consisting of varieties of commodities, which are classified with 10-digit tariff item numbers[3]. Each commodity item fits into at least one of the NTM categories. The cross-NTM distribution of these commodity items within an industrial sector is able to measure that industrial sector's degree of NTMs. That is, all import items of each industrial sector can be classified across four categories: "controlled imports," "discretionary licensing," "source of origin restrictions," and " free imports." Following the approach of Ray (1981), this study measures an aggregate index to represent the level of non-tariff barriers across all manufacturing sectors.

In analyzing the wide dispersion of trade protection across manufacturing sectors, we consider the major determinant of trade protection associated with tariffs (entitled **TF**) and NTMs (entitled NTM). Against the political-economic background of Taiwan, this work considers the following important determinants of Taiwan's trade protection in 2009 and 2013. Empirically, the implementation of tariffs and non-tariff barriers is regarded as a simultaneous process. The nontariff barrier (tariff) equation is regarded as a function of important political and economic variables. The extent of NTM protection given to each industry is calculated as the percentage of protection derived from four types of nontariff restrictions, including free imports. Tariff ratios and NTM are always

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[3] The sectional classification used in the analysis is based on the 2011 version of "The Standard Industry Classification of the Republic of China."

non-negative. Based on Cappellari and Jenkins (2003), both the tariff barrier equation and the nontariff equation are simultaneously estimated using a bivariate Tobit estimation technique.

The bivariate Tobit econometric model considered here is based on Maddala (1983). The main concern is to estimate two parameter vectors, β_1 and, β_2, and two parameters γ_1 and γ_2 in the two-equation model expressed as:

$$y_{1i} = max(\chi'_{1i}\beta_1 + \gamma_1\gamma_{2i} + \upsilon_{1i}, 0) \tag{1}$$

$$y_{2i} = max(\chi'_{2i}\beta_2 + \gamma_2\gamma_{1i} + \upsilon_{2i}, 0) \tag{2}$$

where i=1, 2, . . . , N indicates observations, y_{1i} is the observed variable of TF, y_{2i} is the observed variable of NTM, χ_{1i} is a matrix of explanatory variables that relate to y_{1i}, and χ_{2i} is a matrix of explanatory variables that generate y_{2i}. Both χ_{1i} and χ_{2i} include **KLR**, **FDR**, **CR4**, **IPNET**, **ANTIDUMP**, and **WTOR**, in the tariff and nontariff equation, **β₁** and **β₂** are coefficient row vectors of exogenous variables on the tariff equation and the nontariff equation, respectively, and υ_{1i} and υ_{2i} are error terms. This model can be written in the following equivalent forms:

$$y^*_{1i} = \chi'_{1i}\beta_1 + \gamma_1\gamma_{2i} + \upsilon_{1i} \tag{3}$$

$$y^*_{2i} = \chi'_{2i}\beta_2 + \gamma_2\gamma_{1i} + \upsilon_{2i} \tag{4}$$

and

$$y_{1i} = max(y^*_{1i}, 0) \tag{5}$$

$$y_{2i} = max(y^*_{2i}, 0) \tag{6}$$

y^*_{1i} and y^*_{2i} are the latent variables of TF and NTM, respectively. Both the latent variables and their censored observed counterparts given by Equations 5 and 6 occur simultaneously.

The model can be developed in the context of the joint distribution of (y^*_{1i}, y^*_{2i}), assuming a bivariate normal distribution $BVN(\chi'_{1i}\beta_1 + \gamma_1\gamma_{2i}, \chi'_{2i}\beta_2 + \gamma_2\gamma_{1i} + \upsilon_{2i}, \sigma_1^2, \sigma_2^2, \rho)$ where σ_1, σ_2 and ρ are the standard deviations of the marginal distributions of y^*_{1i} and y^*_{2i}, and the correlation coefficient of y^*_{1i} and y^*_{2i}, respectively.

To simplify the notation in preparation for writing a likelihood function for this model, let g($\cdot,\cdot$) be the joint normal density of (v_{1i}, v_{2i}).

A bivariate Tobit technique is employed in this study, and the empirical results are presented in Table 5 for 2009 and 2013. More precise definitions and data sources of the variables used in the regressions are given in Appendix Table 1. Cross-relation Table of these variables is presented in Appendix Table 2. The determinants of trade protection are considered by the following variables:

KLR: The capital-labor ratio, as measured by the ratio of the value of capital depreciation to labor compensation. Based on the Stolper-Samuelson theorem, this variable may be designed to investigate whether trade policies are in the capitalists' interest or in labor's interest. According to the Stolper-Samuelson theorem, when both labor and capital are mobile between sectors and certain other conditions are satisfied, labor would benefit or suffer from trade protection depending on whether labor is a scarce or plentiful factor in the economy.

Trade policies are considered to be leaning toward capitalists' interests when there is a positive correlation between the capital labor ratio and the degree of trade protection. Otherwise, the trade policies can be regarded as favoring labor's interests. However in this study, KLR can be viewed as examining whether the government's development stance focuses on nurturing capital-intensive industries in recent years, or not. Taiwan is a more labor-intensive country than its principle trade partners, the U.S. and Japan, while Taiwan is a more capital-intensive country in comparison with China.

In this study, the coefficient of **KLR** is unsure. When the coefficient of KLR is positive, the capital-intensive industries in Taiwan are granted high protection and the government may tend to favor entrepreneurs' interests. By contrast, the Taiwan government's concern is labor's interests if the coefficient of **KLR** is negative.

FDR: The final demand ratio, as measured by the proportion of final demand to total demand. **FDR** variables represent consumer product industries. Final-good producers usually succeed in securing trade protection in comparison with intermediate-good producers. This is because the government tends to keep an effective protection

structure across industries. In this study, this variable is designed to characterize a final product industry. An industry with a higher **FDR** is presumed to have higher protection from import competition. Due to the high protection of upstream sectors, the costs of raw materials in producing consumer products are higher. The government protects an industry with a high **FDR** with both tariffs and **NTM**s in order to generate an effective protection structure across industries. That trade protect-structure is the so-called tariff ladder.

CR4: seller concentration, the share of industry shipments accounted for by the largest four private firms. As in Olson (1965), this study presumes that firms within an industry with a higher value of CR4 have a stronger will to lobby for higher protection. Trade policies possess the characteristic of a public good or a collective benefit, because beneficiaries from the policies cannot be excluded. Industry efforts to exert political influence are financed by voluntary contributions on the part of its members. As Olson points out, the common interest group is more likely to overcome the free rider problem inherent in lobbying trade policies effectively if it is small and if benefits are unevenly distributed. The common interest group model is useful in describing the demand side of a political market for protection.

By contrast, an industry associated with a higher seller concentration may find it difficult to gain sympathy from the policy maker. Caves (1976), Ray (1974) and Ray (1981) stress that the government has an incentive to protect an industry possessing voting strength. They hypothesize a negative relationship between the level of protection and the degree of industry centralization in terms of market share. The foregoing view can also be regarded as the supply side of the political market for trade protection.

IPNET: net import penetration ratio, the ratio of net imports to domestic demand. Industries with high import penetration rates face strong competition from foreign producers in the home market. Arguments with respect to import-penetration levels and trade protection are also unclear. Traditional import protection arguments claim that an industry with high import penetration will be more likely to seek protection because the

import competition will more likely be identified as the source of industrial difficulties (Caves 1976, Anderson 1980, Ray 1981, Trefler 1993). Moreover, IPNET is employed by Chang (1987) based on the fact that within Taiwan's manufacturing sector, a large quantity of products are both imported and exported within the same industry. Typically it is hypothesized that if import penetration has resulted in substantial damage to domestic producers, the demand for protection comes either from producers or the government. An industry with higher IPNET is usually expected to have higher trade protections. By contrast, employing a common agency model, Grossman and Helpman (1994) argued that industries with high import penetration should have low protection, because protecting such an industry comes at the expense of greater interests of other industries and leads to high protection costs. In this study, we explore the effect of net import penetration on Taiwan's trade protection associated with tariffs and NTMs.

ANTIDUMP: ratio of adopted antidumping. Antidumping, countervailing and safeguard duties were introduced into Taiwan in 1993. In Taiwan, antidumping action is significantly more common than countervailing and safeguard action. This study just draws on the MOEAITC's list of antidumping investigation cases. **ANTIDUMP** refers to the ratios of tariff items for which antidumping was requested by Taiwanese firms to the total number of tariff items in various industries for 1984-2009, used in both tariff and NTM equations for 2009, and for 2009-2013, further used in these equations for 2013, respectively. The variable proxies the industries which sought investigation of injury, and which can aggressively seek contingent protection. In this study, if the sign of the coefficients of the variable **ANTIDUMP** in both tariff and NTM equations is negative, an AD/CV is regarded as a substitution for trade protection associated with both tariffs and NTMs in order to minimize protection costs. By contrast, if the sign is positive, an AD/CV is regarded as complementary with both tariffs and NTMs.

WTOR: International interest groups. In 1990, Taiwan formerly applied for accession to the GATT, and further assumed observer status in September 1992. Taiwan's observer status shifted to the WTO in January 1995. Taiwan has conducted over 200 rounds of consultations relating to its accession with all 26 members that have

requested such talks. WTRO refers to the ratio of Taiwan's commodity items targeted by the international negotiation for tariff concessions within an industry. The commodity items singled out for tariff concessions came from various rounds of tariff negotiations between the international groups and Taiwan. This study presumes that an industry with higher **WTOR** should have lower trade protection than other industries.

5. Empirical Results and Discussion

Tables 5 and 6 present the empirical results of TF and NTM equations for 2009 and 2013, respectively. Models (1) only include **KLR**, **FDR**, **CR4, IPNET,** and **ANTIDUMP**, and Models (2) further add **WTOR**. As shown in Tables 5 and 6, likelihood ratio tests for all three models are statistically significant, indicating both TF and NTM equations should be estimated jointly.

Moreover, all signs of various $\hat{\rho}\_\mathrm{cons}$ are statistically significant and positive. This suggests that in pursuit of WTO membership and after joining the WTO, Taiwan's TF and NTM across industrial sections are complementary in achieving a given trade protection level. The relationship between tariffs and NTMs demonstrate a significant complementary role in setting trade protection in 2009 and 2013, indicating that the government cannot deliberately used either tariffs or NTMs in assisting industries. This is because due to the pressure from international interest groups, Taiwan's industrial TF setting has their up ceiling. Thus, the government tends to apply NTMs to satisfy the demand for a specific protection level. The government applied NTMs to supplement the constrained tariff measures in establishing trade protection for specific industries. The empirical results are similar to that of Ray (1981). This is because Taiwan has been unable to use discretionary tariff measures, while these measures have had to be in accordance with international agreements such as those of the WTO and APEC. Taiwan has also been under pressure from its major trading partners. The government needs to apply both tariffs and NTMs simultaneously to attain a specific protection level for certain specific industries.

The coefficients of the **KLR** in both TF and NTM equations all are negative and insignificant in Table 5, while those in Table 6 are significant and negative. The

foregoing results indicate that trade protection measures seem to correlate with labors' interests in 2009 and particularly in 2013. After joining the WTO and experiencing the global financial crisis, Taiwan's trade protection may be designed not to develop labor-intensive industries, but to protect labors' interests. A protective trade policy is a way of protecting labors' interests. Particularly after joining the WTO, Taiwan has significantly increased its trade share with developing countries, especially China. Taiwan's industries with lower KLR are the losers from trade liberalization.

In addition, the empirical results are in line with the findings of Liu (2002) regarding the pattern of Taiwan's trade liberalization over the period of the trade talks with the U.S. and pursuing WTO membership. That is, Taiwan's tariff reduction and NTB removal tended to occur in the industries which are capital intensive, and others.

The positive and significant coefficient of **FDR** in both TF and NTM equations is evidence of the **FDR**'s strong effects, indicating that trade protection is designed to favor imports of raw materials, intermediate goods and capital goods for industrial production of the downstream industries in both years. This may be because Taiwan is an economy lacking natural resource, and its economic development heavily relies on the imports of raw materials for production and exports. Trade protection for upstream industries would hurt all economic development.

Column (1) of both Tables 5 and 6 show that **CR4** yields insignificantly negative coefficients in the tariff equations in both 2009 and 2013, while CR4 generates a significantly positive coefficient in the NTM equation in both 2009 and 2013. The empirical results are in line with the presumption in Section 5. To the extent that seller concentration plays a different role in tariff measures compared with nontariff barriers in both years, this study may explain that a common interest group can effectively lobby government for import protection via NTMs. NTMs are often used by the government's executive branches as autonomous policy tools. The coefficient of **CR4** yields a significantly positive result for the nontariff equation. The evidence from nontariff barriers further reflects the fact that the executive branches apply non-tariff measures which tend to protect an industry consisting of larger firms from import competition.

However, the empirical results in Tables 5 and 6 seem to support the arguments of the common interest group model. The coefficient of **CR4** is insignificantly negative on the tariff equation for 2009, while it is significantly positive on the nontariff barrier equation. The empirical results are consistent with Chang (1987), and may indicate that a strong bureaucracy provides higher protection for industries with larger firms through NTMs so that the benefits from protection can be dispersed widely. The government may have weaker authority in making trade policies because interest groups organize a weak demand side of a political market in pursuing their benefit policies.

Furthermore, the means of import protection can be an issue. In Taiwan, tariff revenue is insignificant in the public revenue and is politically inconsequential. NTMs is politically beneficial in assigning privileged private income. The rents from NTMs are assigned to the domestic producers. In line with Cassing and Hillman (1985) and (2016), the quota (NTMs) is political preferred tariff.

As shown in the empirical result of this study regarding **CR4** in 2009 and 2013, after joining the WTO, Taiwan may have developed a political economy model, in which the government may choose NTM as an optimal form of trade protection measures to maximize its political support from industrial producers. In the model, the government balances the support derived from industry interests, which is increased by trade protection, against the opposition of consumers, who are disadvantaged by higher prices. Without considering the revenue motive, the monopolized firm will prefer NTMs to tariffs in terms of profit when both trade measures can yield the same protection. This is because the tariff setting is more transparent and bounded under the WTO. An industry with a high value of **CR4** enjoys import protection in the form of tariffs rather than NTMs.

As argued by Maggi and Rodrıguez-Clare (2000), the existing evidence on the relationship between trade protection and import penetration remains mixed. Several studies, including Fernandes (2007), Broz and Werfel (2014), and Gawande and Krishna (2003), suggest that industries with higher import penetration receive more trade protection. From Tables 5 and 6, it can be seen that IPNET yields significantly

positive coefficients on both tariff and NTM equations in 2009 and 2013. In Taiwan, tariffs, which are approved by the legislature, and NTMs, which are authorized by the executive branch, were used to relieve the difficulties of industries from trade. These empirical results are in line with most traditional arguments that trade protection tends to shield declining industries from import penetration. That is, industries with a large share of net imports in domestic demand represented by **IPNET** are easily granted trade protection in terms of both tariffs and nontariff barriers.

As shown in Tables 5 and 6, the coefficients of variable **ANTIDUMP** are negative in both tariff and NTM equations for 2009 and 2013. That is, after China's joining the WTO, the industries with higher **ANTIDUMP,** in which firms seek trade protection, have much lower tariffs and NTMs. This empirical evidence indicates that the contingent protection can be regarded as a substitute for tariffs and NTMs. The choice of the means of trade protection may tend toward contingent protection instead of tariffs and NTMs.

More interestingly, the coefficient of **ANTIDUMP** is not only negative but also statistically significant only in the NTM equations for both years' models. That is, a contingent protection, such as antidumping, can replace nontariff measures. The empirical evidence may echo Rosendorff (1993) and Ethier (2002), in that there exist similarities and also links between antidumping duties and one kind of NTMs, voluntary export restraints. These are restrictions on the quantities of goods exported to a specific country or countries by the government of the exporting country to avoid antidumping measures or for other reasons. An undertaking by an exporter to increase its export price is another way to avoid the imposition of antidumping duties. This indicates that in the case of Taiwan's trade protection, antidumping also can substitute for NTMs.

Shown in Columns 3 of Tables 5 and 6, the coefficients of variable **WTOR,** denoting international pressure groups, are statistically significant and negative in both tariffs and nontariff equations for both 2009 and 2013. In general, the industries with higher WTOR have lowered tariffs and NTM. International pressure groups still retain influence in deciding the magnitude of Taiwan's tariff reduction and NTM removals.

The empirical evidence is consistent with the presumption in Section 5. After Taiwan's joining the WTO, it has adopted trade liberalization strategies to yield to its trade partners' pressure. The tariff and nontariff structure across Taiwan's industries is subject to the commitments resulting from the trade bargaining with its main trade partners.

More interestingly, when the regression models add the variable **WTOR,** the statistical significance of **CR4** and **IPNET** fades in both TF and NTM equations for 2009 and 2013, while **ANTIDUMP** still retains its statistical significance. To some extent, this empirical finding can be explained by the model of Limão and Tovar (2011) that the government of a small country bargaining with its domestic interest groups can gain by committing to limit its tariff levels through international agreements. In the case of Taiwan's trade protection, its international pressure groups dominate the domestic interest groups in determining its trade policy protection. The adoption of trade protection against import competition is also subject to international pressure groups. That is, backed up by international pressure groups, Taiwan's government enjoyed stronger bargaining power against its domestic interest groups in order to commit to international trade agreements. Only the contingent trade protection, such as AD/CV, remains valid.

6. Concluding Remarks

The question posed at the outset of this study is whether after Taiwan's joining the WTO, the government in formulating the trade protection has been strongly influenced by the domestic common interest groups. Concurrent with the democratic transition since 1990, private interest groups can now engage in lobbying for policies that benefit their own interests. Second, after Taiwan acceded to the WTO in order to escape from international protectionism and diplomatic isolation, Taiwan's trade policies focused on achieving the promises made during a series of accession negotiations with WTO members. To a great extent, Taiwan's trade policy needs to be consistent with existing international norms. The study further examines whether the role played by international pressure groups dominates the pattern of Taiwan's trade protection across

industries. Since antidumping and countervailing duties, the contingent (conditional) forms of protection, are in line with the WTO's norms, both have been more effectively adopted in Taiwan. Third, this study examines whether antidumping measures have effectively replaced tariffs and NTMs in formulating Taiwan's trade protection. Finally, this study explores whether the state's policy preferences tend to protect labor during economic recession.

A simultaneous Tobit technique is applied to review the joint determinants of Taiwan's tariffs and nontariff barriers with various exogenous variables. This study considers the important two-way trade protection, and constructs a political trade protection model to examine whether tariffs and nontariff barriers in 2009 and 2013 were determined by elements of domestic common interest groups, "tariff ladders," net import penetration, the adoption of antidumping, and international pressure groups.

The empirical results indicate that the importance of domestic interest groups, represented by CR4 in determining trade policy, remains in both 2009 and 2013, and elements of the industrial sectors have significant influence in the formation of public policies. Referring to Olson (1965) and Becker (1981), these results may suggest that the democratic transition enables common interest groups to influence the formation of trade policies. Olson's effective lobby theory cannot be rejected by the empirical results of this study. This is because electoral campaigns are significant costs borne by political parties in democratic systems, and private business groups are one of the important sources of economic backing. In a democratic society, common interest groups can be well organized and can be more active than those in an authoritarian society in pursuing their preferred public policies.

This study suggests that tariffs and NTMs are complementary in setting trade protection in 2009 and 2013, which in turn suggests that Taiwan's trade policies have been subject to the constraints of international agreements and pressure from international interest groups, despite the fact that the government was able to use either tariffs or nontariff measures to deliberately protect an industry. The change in tariff ratio needs to be sought by appeal to the legislature, while NTMs are under the authority of

the executive branch, indicating that tariffs are a more temporally stable trade policy instrument than NTMs. But the executive branch can utilize NTMs to relieve industries' difficulties from imports swiftly, and NTMs are less transparent than tariff measures in terms of protection costs (Hillman 1989).

In short, the results of the empirical test support the main argument developed in this study: that domestic interest groups become more aggressive with respect to trade protection during periods of democratic transition. This finding points to the fact that the international pressure groups also effectively dominate the structure of Taiwan's trade protection. In addition, the government can no longer insulate itself politically from the international pressure groups as well as the private business groups when making trade policies. From the case of trade protection policymaking in Taiwan, the outcome of public policies is determined by both supply and demand sides of political markets after joining the WTO, indicating that the Taiwanese government's policy preferences have shifted toward a more neutral political regime.

Table 1. Taiwan's Exports, GDP, and Export Tendency

	Exports (NT$ million)	GDP (NT$ million)	Export tendency (%)
1952	1,468	17,275	8.50
1955	1,917	30,163	6.36
1960	5,966	63,398	9.41
1965	17,987	114,771	15.67
1970	59,257	231,427	25.61
1975	203,170	601,827	33.76
1980	714,624	1,522,625	46.93
1981	832,515	1,805,043	46.12
1982	867,847	1,938,394	44.77
1983	1,008,790	2,170,005	46.49
1984	1,209,578	2,418,884	50.01
1985	1,226,718	2,536,012	48.37
1986	1,509,630	2,966,911	50.88
1987	1,710,000	3,344,962	51.12
1988	1,735,138	3,615,319	47.99
1989	1,751,226	4,033,071	43.42
1990	1,808,420	4,480,288	40.36
1991	2,051,049	5,023,763	40.83
1992	2,064,353	5,614,679	36.77
1993	2,261,835	6,205,338	36.45
1994	2,489,032	6,784,442	36.69
1995	2,994,173	7,396,650	40.48
1996	3,221,533	8,036,590	40.09
1997	3,541,490	8,717,241	40.63
1998	3,760,473	9,381,141	40.09
1999	3,986,374	9,815,595	40.61
2000	4,729,286	10,351,260	45.69
2001	4,270,700	10,158,209	42.04
2002	4,692,990	10,680,883	43.94
2003	5,206,099	10,965,866	47.48
2004	6,148,896	11,649,645	52.78
2005	6,427,175	12,092,254	53.15
2006	7,351,935	12,640,803	58.16
2007	8,169,680	13,407,062	60.94
2008	8,099,233	13,150,950	61.59
2009	6,784,756	12,961,656	52.34
2010	8,777,894	14,119,213	62.17
2011	9,194,198	14,312,200	64.24
2012	9,069,839	14,686,917	61.75
2013	9,235,715	15,230,739	60.64
2014	9,683,403	16,111,867	60.10
2015	9,042,128	16,759,016	53.95
2016	9,033,549	17,118,694	52.77

Data source: Taiwan Statistical Data Book, various years

Table 2 Taiwan's Exports/Imports and Market Shares [a]

	Total		U.S.		Japan		HK and China	
	Exports ($Million)	Imports ($Million)	Exports (%)	Imports (%)	Exports (%)	Imports (%)	Exports (%)	Imports (%)
1952	116	187	3.49	45.7	52.57	31.2	7.71	8.97
1955	123	201	4.38	47.53	59.48	30.46	5.50	1.51
1960	164	297	11.5	38.11	37.67	35.33	12.6	1.59
1965	450	556	21.28	31.72	30.6	39.8	6.21	1.04
1970	1,481	1,524	38.08	23.87	14.56	42.83	9.17	1.79
1971	2,060	1,844	41.7	22.14	11.89	44.85	7.77	2.13
1972	2,988	2,514	41.88	21.62	12.61	41.62	7.67	2.37
1973	4,483	3,792	37.41	25.12	18.37	37.65	6.60	2.62
1974	5,639	6,966	36.12	24.12	14.97	31.8	6.00	1.68
1975	5,309	5,952	34.33	27.76	13.08	30.45	6.84	1.26
1976	8,166	7,599	37.21	23.66	13.41	32.26	7.47	1.33
1977	9,361	8,511	38.85	23.07	11.97	31.05	6.82	2.35
1978	12,687	11,027	39.49	21.55	12.38	33.36	6.76	1.38
1979	16,103	14,774	35.1	22.88	13.96	30.88	7.08	1.39
1980	19,811	19,733	34.12	23.68	10.97	27.13	7.83	1.27
1981	22,611	21,200	36.1	22.48	10.96	27.97	8.39	1.46
1982	22,204	18,888	39.45	24.16	10.73	25.31	7.05	1.63
1983	25,123	20,287	45.11	22.9	9.86	27.54	6.54	1.47
1984	30,456	21,959	48.82	22.96	10.46	29.34	6.85	1.69
1985	30,726	20,102	48.08	23.61	11.26	27.6	8.27	1.59
1986	39,862	24,181	47.7	22.47	11.44	34.14	7.33	1.57
1987	53,679	34,983	44.12	21.86	13.01	33.85	7.68	2.15
1988	60,667	49,673	38.68	26.18	14.46	29.85	9.21	3.87
1989	66,304	52,265	36.25	22.97	13.67	30.67	10.62	4.22
1990	67,214	54,716	32.35	23.05	12.40	29.24	12.73	2.64
1991	76,178	62,861	29.3	22.45	12.06	30.00	16.32	3.57
1992	81,470	72,007	28.93	21.9	10.92	30.23	18.92	3.51
1993	85,091	77,061	27.72	21.7	10.55	30.09	21.71	3.56
1994	93,049	85,349	26.15	21.14	10.98	29.04	22.99	3.98
1995	111,659	103,550	23.65	20.06	11.78	29.23	23.72	4.77
1996	115,942	102,370	23.17	19.51	11.78	26.86	23.64	4.66
1997	122,081	114,425	24.21	20.3	9.58	25.36	24.01	5.16
1998	112,595	105,230	26.61	18.86	8.38	25.71	23.37	5.88
1999	123,733	111,196	25.33	17.82	9.73	27.55	23.78	6.07
2000	151,950	140,732	23.42	17.96	11.11	27.44	24.44	6.11
2001	126,612	109,588	22.22	17.42	10.29	23.82	26.71	7.15
2002	135,774	115,116	20.16	16.53	9.13	23.98	32.21	8.51
2003	151,345	130,249	17.56	13.66	8.25	25.41	35.81	9.86
2004	183,643	171,554	15.69	13.18	7.60	25.84	38.01	11.08
2005	199,761	185,438	14.6	11.8	7.63	25.18	39.18	11.9
2006	225,904	206,442	14.38	11.55	7.31	22.69	39.86	12.89
2007	248,792	223,115	12.93	12.39	6.50	20.94	40.67	13.38
2008	258,051	244,467	12.01	11.29	6.92	19.26	38.97	13.47
2009	205,663	177,598	11.53	10.81	7.11	20.69	41.16	14.42
2010	278,008	256,274	11.39	10.46	6.71	20.65	41.81	14.76
2011	312,923	288,062	11.68	9.64	6.15	18.45	40.25	15.86
2012	306,409	277,324	10.84	9.27	6.40	17.43	39.54	15.87
2013	311,428	278,010	10.48	10.22	6.23	15.72	40.23	16.16
2014	320,092	281,850	10.97	10.66	6.29	14.90	40.15	18.10
2015	285,344	237,219	12.11	12.31	6.87	16.38	39.44	19.70
2016	280,321	230,568	11.96	12.40	6.97	17.62	40.06	19.66

[a] Merchandise trade only at current prices

Data source: Taiwan Statistical Data Book for various years.

Table 3. Taiwan's Tariff Rates and Customs Duty

year	Average Nominal Rate (%)		Average Effective Rate (%)		Customs Duty as % of Central Government Revenue
	All	industry	All	industry	
1955	47.00				13.30
1965	35.40		17.50		22.80
1971	39.10		14.14		22.27
1980	31.17		8.13		21.81
1989	10.74		6.28		13.20
1995	9.75		4.22		9.36
1997	9.80		3.41		
2001	7.97		2.56		6.53
2002	6.99		2.21		6.58
2003	6.32		1.89		6.27
2004	5.74		1.40		5.77
2005	5.67		1.41		5.62
2006	5.60		1.21		5.15
2007	5.57		1.14		5.01
2008	5.56		0.98		4.90
2009	5.71	4.18	1.20	0.72	4.43
2010	5.85	4.18	1.13	0.68	5.98
2011	5.89	4.23	1.16	0.89	5.46
2012	5.89	4.23	1.19	0.90	5.28
2013	5.88	4.23	1.23	0.92	5.29
2014	6.35	4.23	1.20	0.90	5.42
2015	6.35	4.23	1.51	1.29	5.20
2016	6.35	4.23	1.57	1.17	
2017	6.36	4.21	1.48	1.13	
2018	6.39	4.18			

Data source: Custom Administration, Ministry of Finance, https://web.customs.gov.tw/News_Content.aspx?n=3D7C9BFC4F86BF4A&sms=4372861B01 F3270C&s=23469EF4A4D96C8A, and Liu (2001).

[a] The effective real tariff rate in percentage form is defined as the ratio of total customs revenue to total imports.

[b] A tariff schedule with two columns has been in use since 1980. This table only shows the average nominal tariff in the second column. The tariff schedule with three columns has been in use since 2003. The table also just shows average nominal tariffs in the first column.

Table 4 Tariff Structure and Import Restrictions: 2009 and 2013

(%, unless otherwise indicated)

	MFN applied		Final bound [a]
	2009	2013	
Bound tariff lines (% of all tariff lines)	100.0	100.0	100.0
Simple average rate	7.8	7.8	8.1
WTO agricultural products	22.1	22.1	23.0
WTO non-agricultural products	5.0	5.0	5.2
Duty-free tariff lines (% of all tariff lines)	30.1	30.2	28.8
Simple average rate of dutiable lines only	11.2	11.1	11.3
Tariff rate quotas (% of all tariff lines)	1.2	0.8	0.8
Non-ad-valorem tariffs (% of all tariff lines)	1.8	1.8	1.8
Domestic tariff "peaks" (% of all tariff lines)[b]	5.2	4.9	4.8
International tariff "peaks" (% of all tariff lines)[c]	9.3	9.3	9.6
Overall standard deviation of tariff rates	29.3	29.4	29.6
Coefficient of variation of tariff rates	3.8	3.8	3.7
Nuisance tariffs (% of all tariff lines)[d]	4.4	4.4	3.6
Total number of tariff lines	8,730	8,728	8,728
Ad valorem rates	5,945	5,934	6,054
Duty free	2,625	2,635	2,515
Specific rates	89	88	88
Alternate rates	71	71	71
NTMs classification	as % of total importable items		
(1) Item which may be imported but under strict control	0.49%	0.52%	
(2) Items which may be imported but only from certain countries or localities	23.05%	20.26%	
(3) Items which may be imported but only by qualified importer	22.48%	34.88%	

[a] Based on the 2013 tariff schedule in HS07 nomenclature.
[b] Domestic tariff peaks are defined as those exceeding three times the overall average applied rate.
[c] International tariff peaks are defined as those exceeding 15%.
[d] Nuisance rates are those greater than zero, but less than or equal to 2%.
Note: Both tariff schedules are based on HS07 nomenclature.
      Calculations for averages are based on national tariff line level (8-digit); excluding in-quota rate and including AVEs as provided by the authorities.
Source: WTO Secretariat calculations, based on data provided by the authorities, and by this study.

Table 5. Estimations of Tariffs and Nontariff Barriers in Taiwan: 2009

(Multivariate Tobit Models)

	(1)		(2)	
	TF	*NTM*	*TF*	*NTM*
KLR	-0.019	-0.121	-0.026	-0.198*
	(-0.98)	(-1.02)	(-1.43)	(-2.01)
FDR	0.104***	0.302*	0.086***	0.109
	(5.20)	(2.41)	(4.40)	(1.01)
CR4	-0.012	0.363*	-0.033	0.134
	(-0.49)	(2.41)	(-1.41)	(1.03)
IPNET	0.0244**	0.0996*	0.019**	0.038
	(3.28)	(2.30)	(2.58)	(1.00)
ANTIDUMP	-0.134	-2.391*	-0.085	-1.903*
	(-0.79)	(-2.25)	(-0.53)	(-2.17)
WTOR			-0.067***	-0.710***
			(-3.36)	(-6.46)
_cons	0.0179	0.150	0.070***	0.706***
	(1.19)	(1.57)	(3.32)	(6.05)
lnσ_cons	-3.031***	-1.187***	-3.093***	-1.380***
	(-39.38)	(-15.32)	(-39.98)	(-17.81)
$\hat{\rho}$_cons	0.435***		0.294**	
	(4.09)		(2.77)	
# of obs.	92		92	
Wald test	$\chi^2(10)$= 47.74***		$\chi^2(12)$= 103.86***	
Likelihood ratio test of ρ= 0	$\chi^2(1)$=16.32***		$\chi^2(1)$=7.57**	

t statistics in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6. Estimations of Tariffs and Nontariff Barriers in Taiwan: 2013

(Multivariate Tobit Models)

	(1)		(2)	
	TF	*NTM*	*TF*	*NTM*
KLR	-0.037*	-0.103	-0.037*	-0.109*
	(-2.27)	(-1.61)	(-2.54)	(-2.17)
FDR	0.130***	0.313*	0.101***	0.144
	(4.21)	(2.50)	(3.55)	(1.43)
CR4	-0.011	0.317*	-0.048	0.094
	(-0.30)	(2.16)	(-1.42)	(0.78)
IPNET	0.026*	0.088*	0.019	0.042
	(2.34)	(2.09)	(1.82)	(1.21)
ANTIDUMP	-0.244	-1.608*	-0.195	-1.343*
	(-1.25)	(-2.03)	(-1.11)	(-2.15)
WTOR			-0.124***	-0.733***
			(-4.42)	(-7.33)
_cons	0.0241	0.162	0.116***	0.707***
	(1.04)	(1.71)	(3.92)	(6.70)
lnσ_cons	-2.608***	-1.200***	-2.710***	-1.438***
	(-34.17)	(-15.49)	(-35.45)	(-18.53)
$\hat{\rho}$_cons	0.434***		0.212*	
	(4.09)		(1.99)	
# of obs.	92		92	
Wald test	$\chi^2(10)$= 38.38***		$\chi^2(12)$= 115.49***	
Likelihood ratio test of ρ= 0	$\chi^2(1)$=16.27***		$\chi^2(1)$=3.93**	

t statistics in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
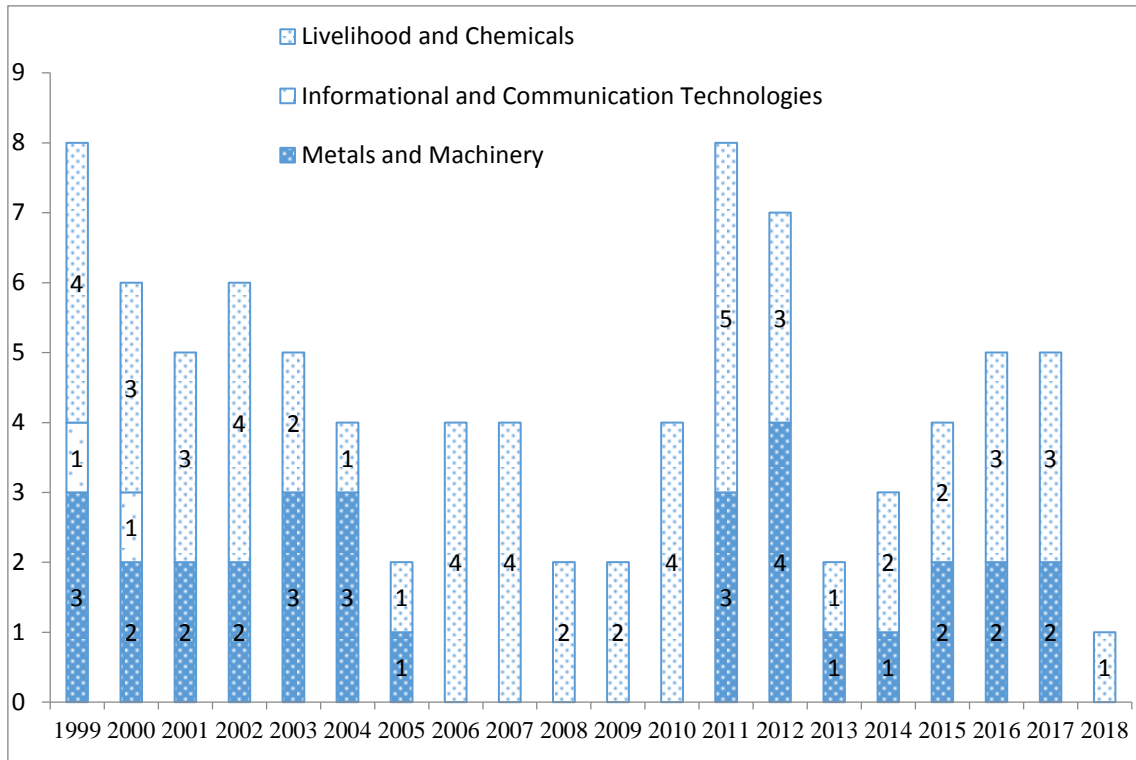
Data source: the International Trade Commission, MOEA

Figures 1 Investigated Antidumping Cases in Taiwan

Appendix Table 1 Variable Definitions and Sample Statistics

Variable	Definition	2009 Mean (Std Dev.)	2013 Mean (Std Dev.)	Data sources
CR4	Percentage of shipments accounted for by four largest firms, 2006 and 2011	0.4730 (0.227)	0.4981 (0.229)	Industrial and Commercial Census, Directorate-General of Budget, Accounting, and Statistics.
ANTIDUMP	Ratio of tariff items for which antidumping requested by Taiwan's firms to the total number of tariff items in various industries for 1984-2009 used in both tariff and NTM equations for 2009, and for 2009-2013 further used in these equations for 2013, respectively.	0.0056 (0.031)	0.0070 (0.041)	International Trade Commission, MOEA (https://www.moeaitc.gov.tw/ITC/main/content/wfrmContentMenu.aspx?menu_id=40)
WTOR	Ratio of tariff items for which tariff concessions requested by its trade partners to total number of tariff items in various industries during trade negotiation for Taiwan's joining the WTO.	0.4937 (0.270)	0.4937 (0.270)	Board of Foreign Trade, MOEA (2002) (https://www.trade.gov.tw/cwto/Pages/Detail.aspx?nodeID=356&pid=332362&dl_DateRange=all&txt_SD=&txt_ED=&txt_Keyword=&Pageid=0)
KLR	Capital-labor ratio, measured by the ratio of the value of capital depreciation to labor compensation..	0.2479 (0.291)	0.4297 (0.562)	2006 Input-Output Table and 2011 Input-Output Table (databank, Directorate-General of Budget, Accounting, and Statistics, 2006 and 2011) .
FDR	Final demand ratio; ratio of final consumption and fixed capital formation to total demand.	0.5020 (0.284)	0.4880 (0.273)	
IPGRS	Ratio of imports to domestic demand of an industry, percentage	0.4034 (0.253)	0.4127 (0.245)	
TF	Average tariff ratio, as a percentage.	0.0539 (0.059)	0.0622 (0.080)	2009 and 2013 Customs Import Tariffs and Classification of Import & Export Commodities of the ROC, Taipei: Directorate-General of Customs, MOF and Board of Foreign Trade, MOEA
NTM	Non-tariff barrier index. This study assigns the trade protection index of controlled import as 1.36, and that for sources of import restriction, specific importers restriction, and special-prior-consent restriction as 0.91 (see Ray, 1981).	0.4108 (0.320)	0.4067 (0.314)	

Appendix Table 2 Cross-relation Table

	TF	NTM	KLR	FDR	CR4	IPNET	ANTIDUMP	WTOR
TF	1.000							
NTM	0.457	1.000						
KLR	-0.200	-0.134	1.000					
FDR	0.330	0.169	0.062	1.000				
CR4	-0.029	0.208	0.236	0.024	1.000			
IPNET	0.143	0.158	-0.312	-0.361	0.034	1.000		
ANTIDUMP	-0.062	-0.160	-0.024	0.013	0.153	0.064	1.000	
RATE	-0.412	-0.628	-0.047	-0.165	-0.284	-0.155	0.006	1.000

References

Amsden, A. (1992). "Taiwan in international perspective." Taiwan's Enterprises in Global Perspective: 25-52.

Anderson, K. (1980). "The political market for government assistance to Australian manufacturing industries." Economic Record **56**(153): 132-144.

Baldwin, R. E. (1984). "Trade policies in developed countries." Handbook of international economics **1**: 571-619.

Baldwin, R. E., T.-J. Chen and D. R. Nelson (1995). Political economy of US-Taiwan trade, University of Michigan Press.

Becker, G. (1981). "A treatise on the family Harvard University Press." Cambridge, MA **30**.

Broz, J. L. and S. H. Werfel (2014). "Exchange rates and industry demands for trade protection." International Organization **68**(2): 393-416.

Cappellari, L. and S. P. Jenkins (2003). "Multivariate probit regression using simulated maximum likelihood." The Stata Journal **3**(3): 278-294.

Cassing, J. H. and A. L. Hillman (1985). "Political influence motives and the choice between tariffs and quotas." Journal of International Economics **19**(3-4): 279-290.

Cassing, J. H. and A. L. Hillman (2016). Political Choice of the Means of Protection. CESIFO Conference: on "The Political economy of income distribution". Venice.

Caves, R. E. (1976). "Economic models of political choice: Canada's tariff structure." Canadian Journal of Economics: 278-300.

Chang, J.-m. (1987). The Determinants of Trade Policies in Taiwan. No. 18, 1987, Chung-Hua Institution for Economic Research.

Chen, T.-J. and C.-m. Hou (1993). The political economy of trade protection in the Republic of China on Taiwan. Trade and Protectionism, NBER-EASE Volume 2,

University of Chicago Press**:** 339-359.

Fernandes, A. M. (2007). "Trade policy, trade volumes and plant-level productivity in Colombian manufacturing industries." <u>Journal of international economics</u> **71**(1): 52-71.

Fordham, B. O. and T. J. McKeown (2003). "Selection and influence: Interest groups and congressional voting on trade policy." <u>International Organization</u> **57**(3): 519-549.

GATT (1993). Accession of the Separate Customs Territory of Taiwan, Penghu, Kinmen and Matsu. <u>Questions and Replies to the Memorandum on Foreign Trade Regime</u>. (L/7097 & Addenda), L/7187.

Gawande, K. and P. Krishna (2003). "The political economy of trade policy: Empirical approaches." <u>Handbook of international trade</u> **1**: 139-152.

Grindle, M. S. (1991). The New Political Economy: Positive Economics and Negative Politics. <u>Politics and Policy Making in Developing Countries: Perspectives on the New Political Economy. An International Center for Economic Growth Publication</u>. G. M. Meier. San Francisco**:** 41-67.

Grossman, G. M. and E.-I. Helpman (1994). "Protection for Sale." <u>The American Economic Review</u> **84**(4): 833-850.

Grossman, G. M. and E. Helpman (1994). "Endogenous innovation in the theory of growth." <u>Journal of Economic Perspectives</u> **8**(1): 23-44.

Hall, R. L. and A. V. Deardorff (2006). "Lobbying as legislative subsidy." <u>American Political Science Review</u> **100**(1): 69-84.

Hillman, A. (2003). Departure from free trade: a survey. <u>CEPR Discussion Papers</u>.

Hillman, A. L. (1989). <u>The Political Economy of Protection,</u>, Harwood Academic.

Hillman, A. L. and H. W. Ursprung (1996). "The political economy of trade

liberalization in the transition." European Economic Review **40**(3-5): 783-794.

Krishna, P. and D. Mitra (2016). Unilateralism in Trade Policy: A Survey of Alternative Political-Economy Approaches. The Political Economy of Trade Policy: Theory, Evidence and Applications, World Scientific Publishing Company**:** 255-270.

Limão, N. and P. Tovar (2011). "Policy choice: Theory and evidence from commitment via international trade agreements." Journal of international Economics **85**(2): 186-205.

Magee, C. and S. Magee (2010). Endogenous trade protection: a survey, Oxford University Press, Oxford.

Magee, S. P., W. A. Brock and L. Young (1989). Black hole tariffs and endogenous policy theory: Political economy in general equilibrium, Cambridge University Press.

Maggi, G. and A. Rodrıguez-Clare (2000). "Import penetration and the politics of trade protection." Journal of International Economics **51**(2): 287-304.

Marks, S. and J. McArthur (1993). Empirical Analyses and the Determinants of Protection: A Survey and Some New Results. International Trade Policies: Gain from Exchange between Economics and Political Science. J. S. O. a. T. D. Willett., The University of Michigan Press.

Mayer, W. (1984). "Endogenous tariff formation." The American Economic Review **74**(5): 970-985.

Mayer, W. and J. Li (1994). "Interest groups, electoral competition, and probabilistic voting for trade policies." Economics & politics **6**(1): 59-77.

Meier, G. M. (1990). Trade policy, development and the new political economy. In The Political Economy of International Trade., Citeseer.

Olson, M. (1965). The logic of collective actionpublic goods and the theory of group.

Olson, M. (1982). The Rise and Decline of Nations: Economic Growth, Stagflation, and Social Rigidities, Yale University Press.

Quibria, M. G. (1989). "Neoclassical political economy: An application to trade policies." Journal of Economic Surveys **3**(2): 107-136.

Ray, E. J. (1974). "The optimum commodity tariff and tariff rates in developed and less developed countries." The Review of Economics and Statistics: 369-377.

Ray, E. J. (1981). "The determinants of tariff and nontariff trade restrictions in the United States." Journal of Political Economy **89**(1): 105-121.

Rodrik, D. (1995). "Political economy of trade policy." Handbook of international economics **3**: 1457-1494.

Smith, H. (1998). "The determinants of manufacturing protection in Taiwan." The Developing Economies **36**(3): 305-331.

Trefler, D. (1993). "Trade liberalization and the theory of endogenous protection: an econometric study of US import policy." Journal of political Economy **101**(1): 138-160.