

# The Effects of Tax Reforms under Imputation Systems on Corporate Foreign Ownership

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## **Abstract**

This study examines the effects of imputation systems and tax reforms under the imputation system on foreign ownership of Taiwanese listed firms. As the tax clientele theory predicted, the results show that after the implementation of imputation systems in 1998, Taiwanese firms with higher imputation credit tend to have a lower percentage of foreign ownership, ceteris paribus. Further, after adopting the alternative minimum tax in 2006, firms paying the higher alternative minimum tax tend to have a lower percentage of foreign ownership. Finally, after reducing the corporate income tax rate in 2010, firms with a decreased effective tax rate tend to have a greater percentage of foreign ownership. Our study extends prior research by providing empirical evidence on the tax clientele theory under an imputation system and contributes to the understanding of the substantive effects of corporate tax reforms under such an imputation system.

**Keywords:** imputation system, foreign ownership, tax clientele hypothesis, alternative minimum tax

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## 1. Introduction

Corporate foreign ownership is an important indicator to measure the extent of international involvements in the domestic economic growth, stock markets and international competitiveness of an economy. For example, the Institute for Management Development (IMD) and World Economic Forum (WEF), two of the world's most important economic institutions, include foreign ownership as an indicator of a country's international competitiveness in their annual evaluative reports. Many institutional investors and rating agencies often use corporate foreign ownership to evaluate the economic status of a country and make market investment decisions.

Academically, previous research has investigated into the effects of foreign ownership on corporate governance and performance across countries (Baek, Kang, and Park 2004; Khanna and Palepu 1999; Wei, Xie, and Zhang 2005). Khanna and Palepu (1999) find that foreign institutional investors play an important role in monitoring Indian firms: firms with high foreign institutional ownership tend to have high-quality corporate governance and performance. Furthermore, Baek, Kang, and Park (2004) investigate the effects of the Asian financial crisis during 1997 on the South Korean stock market and conclude a negative relation between foreign ownership and decreases in corporate share prices. Baek et al. suggest the positive effect of foreign ownership on corporate governance helped firms to mitigate the negative impact on share prices during the Asian financial crisis. Wei, Xie, and Zhang (2005) indicate that China's privatized firms with high foreign ownership tend to have low agency problems and high firm value. The prior literature documents evidence that foreign investors are not only a financing source for a firm but also a key stakeholder to improve corporate governance and firm value. For an economy, therefore, it is essential to maintain or improve corporate foreign ownership.

One of the critical factors affecting foreign ownership in an economy is the tax cost of foreign investors under a given country's tax system. Developing countries often employ tax policies to attract foreign investment. When a country reforms its tax policy, the reforms influence the tax cost of foreign investors, and therefore changes in tax policy are a key factor affecting foreign ownership. However, few studies have addressed the effect of tax reforms on foreign ownership. This study, therefore, aims to help governments, academic researchers and investors better understand the importance of tax policies by investigating the relationship between tax reforms and foreign ownership.

Taiwan has implemented three important tax reforms since 1998: The imputation system, the alternative minimum tax (AMT), and the reduction of the corporate tax rate. These three tax reforms may change the ownership structure of a corporation by changing the relative tax cost of shareholders. Because the ownership structure of a corporation depends on the relative tax costs of domestic and foreign shareholders, foreign ownership

may change if the relative tax costs of domestic and foreign shareholders change. For example, if initially both domestic and foreign shareholders were taxed at a tax rate of 40% on distributed dividend income, the domestic and foreign shareholders would have the same benefit from a corporate distribution, all else being equal. Yet, when the tax rate for domestic shareholders is reduced to 25% and the tax rate for foreign shareholders remains at 40%, we would predict an increase in the percentages of domestic ownership and, correspondingly, a decrease in the percentage of foreign ownership, because the relative tax rate becomes higher for foreign shareholders after the decrease of the rate for domestic shareholders.

Taiwan implemented the imputation system in 1998. The system integrates corporate and personal income taxes into one tax system for income derived from business income. Under the Taiwanese imputation system, when distributing dividend income to shareholders, firms also grant imputation credits to their domestic shareholders, allowing the credits to offset the shareholders' personal income tax. However, the imputation credit is not granted to foreign shareholders. Consequently, domestic and foreign shareholders face different taxation systems for dividend income under this Taiwanese imputation system. In addition, the relative tax costs for domestic and foreign shareholders changed after the implementation of the imputation system, despite the fact that the corporate tax rates and personal income tax rates remaining the same as before. Foreign shareholders are therefore likely to reduce their ownership in Taiwanese firms due to the imputation system since their relative overall tax costs on dividend income appear greater than those of domestic shareholders who can benefit from the imputation credits.

Prior studies show that the featured difference between imputation systems and classical systems may impact many aspects of a firm's decision making (Chen and Gupta 2011). Schulman et al. (1996) and Twite (2001) find firms decrease their debt-to-equity ratio after the implementation of imputation systems in countries such as Canada, New Zealand and Australia. Pattenden and Twite (2008) find that Australian firms increase dividend payout ratios and dividend reinvestment after the implementation of an imputation system. Chen and Gupta (2011) find that Taiwan-based multi-national companies (MNCs) with greater imputation credits tend to repatriate more dividends from their Chinese subsidiaries. Black, Legoria, and Sellers (2000) find that imputation systems increase corporate investment in New Zealand and Australia. Prevost, Rao, and Wagster (2002) find that imputation systems have a greater positive effect on the stock prices for firms with higher dividend payout ratios, lower debt to equity ratios, and higher effective tax rates.

The aforementioned studies investigated the impacts of implementing imputation systems on corporate capital structure (Schulman et al. 1996; Twite 2001), dividend policies (Chen and Gupta 2011; Pattenden and Twite 2008), capital investment (Black,

Legoria, and Sellers 2000), and firm value (Prevost, Rao, and Wagster 2002). However, the prior studies have not addressed the effects of imputation systems on corporate ownership. Therefore, the first objective of this study is to investigate the effects of imputation systems on corporate foreign ownership.

There have been two major changes to the Taiwanese corporate income tax system since the implementation of the imputation system in 1998 -- the adoption of the AMT in 2006 and the reduction of the corporate income tax rate from 25% to 17% in 2010. Because domestic shareholders and foreign shareholders face different taxation systems under the Taiwanese imputation system, increasing or decreasing tax rates under the imputation system will produce different impacts on the relative overall tax costs of dividend income for domestic and foreign shareholders.

The adoption of the AMT under the Taiwanese imputation system increased corporate income tax for firms subject to the AMT. It is worth noting that under the imputation system, the AMT paid by the firms can be imputed as imputation credits for domestic shareholders to offset shareholders' personal income tax upon dividend distribution. As a result, the overall tax costs of dividend income for domestic shareholders remain unchanged. However, the adoption of the AMT under the imputation system may increase the overall tax costs of dividend income for foreign shareholders because imputation credits cannot be used to offset the personal income tax of foreign shareholders. Therefore, the adoption of the AMT under the imputation system affects the relative tax costs<sup>1</sup> of both domestic shareholders and foreign shareholders. Similarly, reducing the corporate income tax rate under the imputation system also reduces the imputation credit for domestic shareholders, leaving their overall tax costs unchanged. Foreign shareholders, nevertheless, may benefit from the reduction of the corporate income tax rate because, *ceteris paribus*, the after-tax earnings distributable to foreign shareholders can increase due to the reduction of the corporate tax rate. Taken together, unlike the effects of corporate tax reforms in classical systems, increasing or decreasing corporate tax under the imputation system may produce different effects on the relative overall tax costs of domestic and foreign shareholders.

Prior studies on the tax clientele theory show that different types of shareholders adjust their share percentages in response to changes in relative tax costs arising from changes in corporate dividend policies or changes in the tax systems under classical tax systems (Allen, Bernardo, and Welch 2000; Bajaj and Vlijh 1990; Denis, Denis, and Sarin 1994; Dhaliwal, Erickson, and Trezevant 1999; Elton and Gruber 1970). Elton and Gruber (1970), Bajaj and Vlijh (1990) and Denis, Denis, and Sarin (1994) document evidence

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<sup>1</sup> We define the overall tax costs as the total taxes paid at the corporate level and individual shareholders' level.

that abnormal stock returns on ex-dividend dates are related to differences in tax rates between capital gains and dividend income. Dhaliwal, Erickson, and Trezevant (1999) and Allen, Bernardo, and Welch (2000) find after firms initiate a cash dividend or pay greater dividends, the ownership of institutional investors increases while the ownership of individual investors decreases because dividends are relatively tax-disadvantaged for individual investors.

Previous research has indicated that the relative tax rates on dividends and capital gains affect marginal stockholders' decisions as to whether to sell their stocks before the ex-dividend date. The finding suggests that changes in the relative tax rates between different types of shareholders may affect their decision to adjust their stock portfolio. Therefore, we posit that when the relative tax rate between domestic and foreign shareholders changes due to the implementation of imputation systems, domestic shareholders with a lower relative tax rate have incentives to hold more shares and, on the contrary, foreign shareholders with a higher relative tax rate have incentives to sell their shares to domestic shareholders, resulting in a change in the ownership structure.<sup>2</sup>

The aforementioned studies are in the context of classical systems and focus on the ownership structure between institutional and individual investors. The Taiwanese imputation system and the two tax reforms under the imputation system, however, provide a unique and rare opportunity to test whether the tax clientele theory remains pronounced under the imputation system regime and to examine the effects of the tax system on the ownership structure between domestic and foreign shareholders. Therefore, the second objective of this study is to examine the effect of tax clientele on the foreign ownership of Taiwanese listed firms under the imputation system regime. The advantage of our research design is to allow the examination of comprehensive tax effects -- extending from the introduction of the imputation system to the increase and decrease of corporate tax under the imputation system.

Our empirical results show that after the implementation of the imputation system in 1998, firms paying greater imputation credit to domestic shareholders tend to have a lower percentage of foreign shareholder ownership, *ceteris paribus*. Furthermore, after the adoption of the AMT under the imputation system, firms paying a higher alternative minimum tax tend to have lower percentages of foreign shareholder ownership. Finally, after the reduction of corporate income tax rates under the imputation system, firms with decreased effective tax rates tend to have a greater percentage of foreign shareholder ownership. Our further analyses show that the significant effects mainly stem from changes in the levels of

<sup>2</sup> During our sample period, Taiwan did not impose a tax on capital gain for listed and OTC stocks. Therefore, the capital gain tax does not affect the relative tax costs between domestic and foreign shareholders with respect to the three tax reforms in our sample period.

foreign institutional ownership rather than from changes in foreign individual ownership. In addition, we find that corporate and financial institutional investors respond to the changes in tax reforms more actively than trust fund institutional investors.

Finally, domestic and foreign shareholders may not adjust their relative ownership if they do not expect firms to distribute dividends. We, therefore, conduct additional analyses to address this concern. Our results show that the impacts of the implementation of imputation systems and the reduction in the corporate tax rate remain pronounced and consistent with our expectations after controlling for the effects of the expected probability of firms' dividend payout as well as the previous tax reforms in the following sample periods. These findings are consistent with the predictions of the tax clientele theory and investor heterogeneity, and provide evidence to support that the tax clientele theory remains pronounced under an imputation system regime.

Our paper makes several contributions as follows. First, prior research on imputation systems mainly examined the effect of imputation systems on corporate financing and dividend policies. Our paper extends prior research on imputation systems by providing empirical evidence on the effects of the implementation of the imputation system and tax reforms under an imputation system on foreign ownership in Taiwanese listed firms. The results of our study show that the tax clientele theory remains pronounced under the imputation system regime.

Furthermore, foreign ownership in the stock market is often regarded by the governments of emerging countries as an important indicator to assess the levels of a country's economic development and an investment-friendly environment. Prior studies have investigated the effects of corporate profitability and corporate governance on foreign ownership (Dahlquist and Robertsson 2001; Kang and Stulz 1997). However, our study examines the effect of relative tax costs between domestic and foreign shareholders on foreign ownership. The results of our paper provide evidence that tax reforms under imputation systems result in changes in foreign ownership in the stock market.

The remainder of this paper proceeds as follows: Section 2 discusses the institutional background of the Taiwanese imputation system and the related corporate tax reforms under the system. Section 3 develops the research hypotheses and provides empirical models and procedures used to test our hypotheses. Section 4 presents and discusses our empirical findings, and Section 5 concludes our research results and their implications.

## 2. Institutional Background

Our study analyzes three important tax reforms in Taiwan: the implementation of the imputation system in 1998, the enactment of the AMT in 2006, and the reduction

of corporate tax rates in 2010. The following provides a brief introduction of the three reforms.

Critics of the classical income tax system commonly emphasize the problem of double taxation of corporate income: once at the corporate level and again at the shareholder level when firms distribute dividends. Double taxation imposes an uncompetitive cost burden on firms residing in areas that use the classical system, a burden that distorts corporate financing policy and dividend decisions. For example, firms adhering to the classical tax system tend to favor debt over equity financing to reduce corporate income taxes and therefore defer dividend distributions to reduce personal income taxes for shareholders. However, this is economically inefficient as it causes the firm to deviate from its optimal capital structure and dividend policy.

In order to stimulate private investment and alleviate double taxation on corporate income, in 1998 Taiwan implemented its most extensive and important tax reform in recent years: the imputation system. The imputation system grants credit to domestic shareholders for income tax paid at the corporate level to offset the shareholders' personal income tax, thereby alleviating the double taxation of business income at the shareholder level. However, foreign shareholders are still subject to a withholding tax on distributed dividends and are not allowed to offset their personal withholding tax on dividends using the imputation credit. Therefore, the imputation system in Taiwan has changed the relative tax costs for domestic and foreign shareholders, although the system has not changed the tax rates at either the corporate or the shareholder level.

The Taiwanese corporate tax rate was virtually flat, at 25%, until 2010. During our sample period, the highest personal tax rate for domestic shareholders was 40% and the withholding tax rate for foreign shareholders was a flat rate of 20%. Under the classical tax system, the overall corporate and personal tax rate of dividend income for domestic shareholders was 55% [= (25% + (1 - 25%) × 40%)]. Under the imputation system, since taxes paid at the corporate level are imputed as a credit to domestic shareholders and can be used to offset their personal income tax, the overall corporate and personal tax rate of dividend income for domestic shareholders only depends on the shareholders' personal tax rate. Thus, the imputation system reduced the overall tax rate to 40% from 55%. In contrast, foreign shareholders are not allowed to use the imputation credit to offset their withholding tax, and thus their overall corporate and personal tax rate under the imputation system remains at 40% [= (25% + (1 - 25%) × 20%)].

As tax incentives are an important policy tool to stimulate investment for emerging countries, the Taiwanese government provided abundant tax incentives to promote investment and technological advancement in the Statute for Upgrading Industries (1999 ~ 2009). The statute provided two major types of tax incentives to stimulate investments in

qualified hi-tech industries. Firms investing in qualified industries could either select a 5-year exemption from corporate income tax on income derived from those investments, or alternatively, firms could select to pass the tax incentive to their shareholders by granting shareholders an investment tax credit of up to 20% of the qualified investment amount. The loss of tax revenue from the incentives was significant and grew rapidly. For example, statistics from the Taiwanese Ministry of Finance show that the overall exempted tax revenue resulting from these two tax incentives from 1999 to 2005 amounted to approximately NT\$ 114.5 billion and was mainly concentrated in a few qualified industries. To address the concerns about the growing loss of tax revenue and the distortion in tax equity from the overly-generous tax incentives, Taiwan enacted the AMT in 2006. During our sample periods, firms with pretax income above NT\$ 2 million and paying an effective tax rate below 10% were subject to the AMT of up to 10% of the effective tax rate on corporate income.

Firms subject to the AMT incurred higher tax costs at the corporate level. However, the effects of the AMT on the overall tax costs of shareholders under the imputation system are different across the two types of shareholders. Because tax paid at the corporate level can be imputed as the imputation credit and used to offset domestic shareholders' personal income tax, the AMT under the imputation system did not increase overall tax costs for domestic shareholders. However, because foreign shareholders are not allowed to offset their personal income tax on dividends using the imputation credit, the tax cost imposed by the AMT at the corporate level increases the tax cost for foreign shareholders of firms subject to the AMT. Consequently, the enactment of the AMT in Taiwan in 2006 changed the relative tax costs between domestic and foreign shareholders of firms subject to the AMT.

The exuberant tax incentives of the Statute for Upgrading Industries caused an enormous loss of tax revenue. Therefore, in 2010 the Taiwanese government decided to replace the Statute for Upgrading Industries with the Industrial Innovation Act, which essentially eliminated all tax incentives except for the R&D tax credit. Nevertheless, from 2008 to 2011, many of Taiwan's competing countries lowered their corporate income tax rates. For example, China, Singapore, Korea, Hong Kong and Ireland reduced their corporate tax rates to 25%, 17%, 22%, 16.5% and 12.5%, respectively. As a compromise to the elimination of essentially all tax incentives in the Statute for Upgrading Industries and to accommodate the global trend of lowering corporate tax rates in comparable Asian countries, Taiwan, in addition to replacing the Statute for Upgrading Industries with the Industrial Innovation Act, reduced its corporate tax rate from 25% to 17% in 2010.

A decrease in corporate tax rates reduces tax cost at the corporate level. However, reducing taxes paid at the corporate level also reduces the imputation credit on dividends

distributed to domestic shareholders. As explained above, under the imputation system, the overall corporate and personal tax rate of dividend income for domestic shareholders depends only on their personal tax rate. Hence, under the imputation system, the overall tax rate of dividend income for domestic shareholders remained at 40% regardless of the change in the corporate tax rate from 25% to 17%.

Foreign shareholders, however, are not allowed to use the imputation credit to offset their withholding tax upon receiving dividend income from firms. Therefore, similar to the results under the classical tax system, the reduction in corporate tax rates reduced the overall tax costs for foreign shareholders. The overall corporate and personal tax rate of dividend income for foreign shareholders was reduced from 40% to 33.6% [ $= (17\% + (1 - 17\%) \times 20\%)$ ] when the corporate tax rate was reduced from 25% to 17%. Therefore, the reduction in the corporate tax rate in Taiwan in 2010 reduced the relative overall tax costs for foreign shareholders of firms whose effective tax rates were lowered in 2010 and thereafter.

### 3. Research Methods

#### 3.1 Research Hypothesis

Elton and Gruber (1970) argue that firms with different dividend policies attract different tax clienteles of shareholders because shareholders have different marginal tax rates, and dividend income and capital gains are taxed at different tax rates. *Ceteris paribus*, investors with relatively high tax rates will prefer capital gains to dividend income and thus are more likely to be the tax clientele of shareholders for firms with low dividend payout ratios. Bajaj and Vijh (1990) and Denis, Denis, and Sarin (1994) find an abnormal return on high dividend yield stocks on ex-dividend dates as a form of compensation for higher tax rates on dividend income. Dhaliwal, Erickson, and Trezevant (1999) and Allen, Bernardo, and Welch (2000) find that institutional investors are more likely to be the tax clientele of shareholders for firms with high dividend payout ratios because institutional investors have relatively low tax rates on corporate dividend income.<sup>3</sup> Therefore, the tax clientele theory suggests that the ownership structure depends on the relative tax rates between different types of shareholders.

Taiwan implemented the imputation system in 1998. Although the then statutory corporate tax rate remained the same under the imputation system, the relative tax rates

<sup>3</sup> Generally, a U.S. corporation that receives dividends from another corporation is entitled to a deduction of 70% of the dividends it receives. The deduction increases to 80% and 100% if the corporation receiving the dividends owns 20% or more of and more than 80% of the distributing corporation, respectively.

for domestic shareholders decreased. Because the system granted the imputation credit to domestic shareholders to offset their personal income tax, the overall tax rate on dividend income for domestic shareholders in a high tax bracket are reduced from 55%, to 40%, a 27% reduction in the overall tax rate. In contrast, the new system continued to tax foreign shareholders at an overall tax rate of 40% as they were not allowed to use the imputation credit to offset their withholding tax on dividend income. Therefore, the changes in relative tax rates between domestic and foreign shareholders depend on the imputation credit rates that domestic shareholders receive: the greater the imputation credit rate, the greater the tax savings for domestic shareholders and the more burdensome the tax disadvantage for foreign shareholders. Accordingly, we predict a negative association between foreign ownership and imputation credit rates after the implementation of the imputation system, and propose our hypothesis H1 as follows:

**H1:** *Ceteris paribus, firms with greater imputation credit rates are negatively associated with foreign ownership in the year of the implementation of the imputation system and thereafter.*

The present U.S. AMT was enacted in 1982 and limits tax benefits from a variety of deductions.<sup>4</sup> It is evident that under the classical system, the enactment of the AMT will increase AMT firms' corporate income tax and, hence, decrease after-tax dividend income for both domestic and foreign shareholders of AMT firms. Prior research has documented evidence that US firms that were susceptible to the AMT altered their earnings-reporting behavior in response to the AMT by managing the book income adjustment to minimize the AMT cost (Dhaliwal and Wang 1992; Gramlich 1991; Manzon 1992).

In order to restrict the then overly-abundant tax incentives, Taiwan also enacted the AMT in 2006. However, the effect of the AMT on the overall tax cost of shareholders under the imputation system is different from that under the classical tax system. Because taxes paid at the corporate level can be imputed as an imputation credit and used to offset domestic shareholders' personal income tax, the enactment of the AMT under the imputation system does not necessarily increase the overall tax costs for domestic shareholders. However, foreign shareholders are not allowed to offset their personal income tax on dividends by using the imputation credit. Hence, the tax cost imposed by the AMT at the corporate level is likely to increase the overall tax cost for foreign shareholders of firms subject to the AMT. As a result, it is possible that the relative tax cost for foreign shareholders has increased after the enactment of the AMT in Taiwan. Accordingly we predict a decrease in foreign ownership for firms that are subject to the AMT, and propose our hypothesis H2 as follows:

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<sup>4</sup> Since 1982, the US has made several amendments to its AMT system.

**H2:** *Ceteris paribus, firms paying greater AMT are negatively associated with foreign ownership in the year of the enactment of the AMT system and thereafter.*

To follow the global trend of lowering corporate tax rates and to compete with Asian countries, Taiwan reduced its corporate tax rate from 25% to 17% in 2010. Unlike the reduction of corporate tax rates under the classical tax system, the effects of corporate tax rate reduction under imputation systems may depend on the types of shareholders. The reduction in corporate tax rates also reduces the imputation credit rate on dividends distributed to domestic shareholders, and, therefore, the overall tax costs of domestic shareholders under the imputation system remained the same despite the fact that the corporate tax rate was reduced from 25% to 17%. In contrast, the overall tax costs of foreign shareholders may decrease by as much as 16% after the corporate tax rate was reduced from 25% to 17%.<sup>5</sup> Accordingly, we predict an increase in foreign ownership for firms whose effective tax rates decreased after the corporate tax rate reduction, and propose our hypothesis H3 as follows:

**H3:** *Ceteris paribus, firms with a decrease in effective tax rates are positively associated with foreign ownership in the year of the reduction in the statutory corporate tax rate and thereafter.*

### 3.2 Econometric Methods

The dependent variable of interest in the regression models is foreign ownership (FOR\_SH), defined as the percentages of common shares outstanding owned by foreign shareholders. The explanatory variables in the models consist of the test variables related to our research hypotheses and control variables that draw on the prior literature to account for nontax factors likely to influence a firm's foreign ownership structure.

To provide additional control for nontax factors likely to influence a firm's ownership structure, we use the fixed-effects estimation procedure with panel data that include individual firms' fixed effects. Panel data estimation techniques allow control for various time-invariant factors associated with an individual firm's ownership structure that may be unobservable or difficult to measure. For example, corporate vision and strategy, market positioning, and global visibility may determine a firm's attraction to foreign investors; yet, these aspects are largely unobservable in archival data. Because these factors may not change dramatically within a short period of time, the firm-fixed effects control for their influence in the estimation.

Based on our three hypotheses and the prior literature, we specify our empirical

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<sup>5</sup>  $[0.25 + (1 - 0.25) \times 0.2 - 0.17 + (1 - 0.17) \times 0.2] / [0.25 + (1 - 0.25) \times 0.2] = (0.4 - 0.336) / 0.4 = 16\%$

regression models in Equations (1) to (3) to examine the effects of the imputation system and the related tax reforms under the imputation system on foreign ownership of Taiwanese listed firms as follows:

*Regression Model -- the effect of the imputation system on foreign ownership*

$$FOR\_SH_{it} = \alpha_0 + \alpha_1 ICR_{it} + \alpha_2 D\_Imputation_t + \alpha_3 ROE_{it} + \alpha_4 SIZE_{it} + \alpha_5 BOARD_{it} + \alpha_6 DEBT_{it} + \alpha_7 MB_{it} + \alpha_8 DIV_{it} + \varepsilon_{it} \quad (1)$$

*Regression Model -- the effect of the AMT on foreign ownership under the imputation system*

$$FOR\_SH_{it} = \beta_0 + \beta_1 AMT_{it} + \beta_2 D\_AMT_t + \beta_3 ROE_{it} + \beta_4 SIZE_{it} + \beta_5 BOARD_{it} + \beta_6 DEBT_{it} + \beta_7 MB_{it} + \beta_8 DIV_{it} + \varepsilon_{it} \quad (2)$$

*Regression Model -- the effect of corporate tax rate reduction on foreign ownership under the imputation system*

$$FOR\_SH_{it} = \gamma_0 + \gamma_1 ETR\_Decr_{it} + \gamma_2 D\_Recr_t + \gamma_3 ROE_{it} + \gamma_4 SIZE_{it} + \gamma_5 BOARD_{it} + \gamma_6 DEBT_{it} + \gamma_7 MB_{it} + \gamma_8 DIV_{it} + \varepsilon_{it} \quad (3)$$

The subscripts i and t index the individual firm and the sample year, respectively. The dependent variable, *FOR\_SH*, captures the ownership of foreign shareholders, and is measured as the number of common shares held by foreign shareholders divided by the number of total common shares outstanding. The following are brief definitions of the independent variables with their expected signs on the regression coefficients in parentheses:

- ICR (-)* = imputation credit rate, measured as imputation credit per share, cash dividends per share;
- AMT (-)* = the amount of AMT paid scaled by pretax income;
- ETR\_Decr (+)* = dummy for firms whose effective tax rates decrease after the corporate tax rate reduction and for the sample years in 2010 and thereafter;
- D\_Imputation (?)* = dummy for the sample years after the implementation of the imputation system;
- D\_AMT (?)* = dummy for the sample years after the enactment of the alternative minimum tax;
- D\_Decr (?)* = dummy for the sample years after the reduction of the corporate income tax rate;
- ROE (+)* = return on equity, measured as net income, average shareholders' equity during the sample year;

<i>SIZE</i> (+)	= firm size, measured as the natural log value of total assets at the beginning of the sample year;
<i>BOARD</i> (?)	= board ownership, measured as the percentages of common shares owned by the board of directors at the end of the sample year;
<i>DEBT</i> (-)	= debt ratio, measured as total liabilities at end of the sample year, total assets at the end of the sample year;
<i>MB</i> (+)	= market-to-book ratio, measured as market value of equity, book value of equity at the end of the sample year;
<i>DIV</i> (+)	= dividend payout ratio, measured as cash dividends per share, earnings per share for the sample year.

### 3.2.1 Test Variables

We include three test variables, *ICR*, *AMT* and *ETR\_Decr*, in Equations (1) to (3), respectively.

The imputation credit rate (*ICR*) measures the effect of the introduction of the imputation system on the relative tax costs of foreign shareholders. According to H1, domestic shareholders benefit from the imputation system. The tax benefits of domestic shareholders under the imputation system are positively related to imputation credit rates. Accordingly, the relative overall tax cost for foreign ownership would appear to be more disadvantageous as the imputation credit rate increases. Hence, we conjecture that foreign ownership is negatively associated with imputation credit rate after the implementation of the imputation system. We predict the coefficient on *ICR* to be negative in Equation (1).

The alternative minimum tax (*AMT*) measures the increase in tax liabilities imposed on the sample firms due to the enactment of the AMT. Although firms paying the AMT may increase their tax costs at the corporate level, the AMT paid by the firms can be imputed as an imputation credit and used to offset domestic shareholders' personal income tax under the imputation system. As a result, the AMT paid at the corporate level may not increase the overall tax cost of domestic shareholders. However, foreign shareholders are not allowed to offset their personal income tax by using the imputation credit, and thus the relative overall tax costs would increase for foreign shareholders of firms paying the AMT. Hence, according to our H2, we predict the coefficient on *AMT* to be negative.

The decrease in effective tax rates (*ETR\_Decr*) is a dummy variable indicating firms whose effective tax rates decrease after the corporate tax rate reduction in 2010 and for the sample years in 2010 and thereafter. Under the imputation system, a decrease in the corporate tax rate also decreases the imputation credit rate on dividend income for domestic shareholders. Therefore, we conjecture that the overall tax costs do not decrease for domestic shareholders of firms that are able to pay lower effective tax rates

after the corporate tax rate reduction. However, the overall tax costs decrease for foreign shareholders of firms paying lower effective tax rates in 2010 and thereafter because their overall tax costs are independent of the imputation credit. Hence, according to our H3, we predict the coefficient on *ETR\_Decr* to be positive.

### 3.2.2 Control Variables

We include three time period dummy variables, *D\_Imputation*, *D\_AMT* and *D\_Decr*, in Equations (1) to (3), respectively, to control for the differences in macro-level factors that may affect foreign ownership before and after each tax reform in the three sample periods. However, we have no predicted sign on the coefficients of the three time period dummy variables.

Prior studies show that foreign investors have disproportionately high holdings of profitable firms and growth firms to pursue a better return on stock investments (Dahlquist and Robertsson 2001; Elkinawy 2005; Kang and Stulz 1997). In addition, large firms are better known internationally and stocks of large firms have more liquidity. Hence, foreign investors are more likely to invest in large firms (Dahlquist and Robertsson 2001; Kang and Stulz 1997). Therefore, we include return on equity (*ROE*), market-to-book ratios (*MB*), and firm size (*SIZE*) in the regression models to control for the investment preferences of foreign investors for profitable firms, growth firms, and large firms, respectively. We predict the coefficients on *ROE*, *MB* and *SIZE* to be positive.

In contrast, foreign investors are less likely to invest in firms with high financial risk (Dahlquist and Robertsson 2001; Kang and Stulz 1997). We therefore include debt ratio (*DEBT*) in the regression models to control for the effect of financial risk on foreign ownership. We predict the coefficient on *DEBT* to be negative.

Finally, we also include board ownership (*BOARD*) and dividend payout ratio (*DIV*) to control for the effects of agency costs and dividend policies on foreign ownership. There are two opposing hypotheses about the effect of board ownership on firm value. The convergence-of-interest hypothesis predicts that increasing board ownership has a positive effect on firm value because the congruence of interest between management and firm helps reduce agency cost as board ownership increases (Jensen and Meckling 1976). In contrast, the conflict-of-interest hypothesis predicts a negative relationship between board ownership and firm value because management may exhibit anti-takeover behavior when board ownership is high (Jensen and Ruback 1983). Furthermore, prior studies show that foreign investors prefer to invest in firms with high dividend payout ratios (Allen, Bernardo, and Welch 2000; Dhaliwal, Erickson, and Trezevant 1999). However, dividend income was more disadvantageously taxed than capital gains on stocks during our sample periods because Taiwan did not impose a capital gain tax on listed stocks until 2013. Hence, we include *BOARD* and *DIV* in the regression models to control for the

effects of agency cost and dividend policies. However, we have no predicted signs on the coefficients of *BOARD* and *DIV*.

### 3.3 Data and Sample Selection

Panels A, B, and C of Table 1 outline the sample selection procedures for Equations (1) to (3), respectively. We select the three sample periods in accord with our three hypotheses. The hypotheses are related to the three tax reforms enacted in 1998 (the imputation system), 2006 (the AMT), and 2010 (the corporate tax rate reduction). The three sample periods spanning before and after the three tax reforms -- the imputation system, the AMT, and the corporate tax rate reduction -- are 1994 to 2002, 2003 to 2008, and 2008 to 2012, respectively.

**Table 1. Sample Selection Procedures**

Panel A: Implementation of Imputation Systems (Sample Period from 1994 to 2002)	
	Number of firm-observations
Initial firm-year observations	4,063
Less:	
Firms in finance and insurance industries	(143)
Firm-year observations with missing data	(532)
Firms with less than two observations <sup>a</sup>	(123)
Final sample	3,265
Panel B: Implementation of Alternative Minimum Tax System Under Imputation Systems (Sample Period from 2003 to 2008)	
	Number of firm-observations
Initial firm-year observations	6,819
Less:	
Firms in finance and insurance industries	(246)
Firms not subject to AMT	(5,141)
Firm-year observations with missing data	(394)
Firms with less than two observations <sup>a</sup>	(43)
Final sample	995
Panel C: Reduction in Corporate Tax Rates Under Imputation Systems (Sample Period from 2008 to 2012)	
	Number of firm-observations
Initial firm-year observations	6,735
Less:	
Firms in finance and insurance industries	(211)
Firm-year observations with missing data	(373)
Firms with less than two observations <sup>a</sup>	(51)
Final sample	6,100

Note: <sup>a</sup> Firms with less than two firm-year observations were deleted in order to use panel data estimation.

We begin with all firms listed on the Taiwan Stock Exchange (TSE) and Over-the-Counter (OTC) Markets during the sample periods. Our sample excludes financial firms and banks because they have different settings of regulations and financial reporting standards. We eliminated firms with missing variables required by the regression models and firms with less than two firm-year observations for the technical purposes of panel data estimation. Although the AMT was enacted in 2006, only firms whose effective tax rates are less than 10% are required to file AMT returns. The majority of listed firms, however, are not subject to the AMT. Therefore, we exclude firms that were not subject to the AMT from the sample for Equation (2). Thus, our final samples consist of 3,265, 995 and 6,100 firm-year observations for the sample periods of Equations (1) to (3), respectively.

Financial statement data and information about corporate ownership structure were obtained from the *Taiwan Economic Journal* (TEJ) database. Information about identifying firms paying the AMT and the AMT amount was manually collected by examining the footnote disclosures in the financial statements of all sample firms.

## 4. Empirical Results

### 4.1 Descriptive Statistics

Tables 2, 3, and 4 present descriptive statistics of the selected variables for Equations

**Table 2. Descriptive Statistics for Selected Variables -- Effect of Imputation Systems ( $N = 3,265$ )**

	Mean	Std. Dev.	Min. <sup>a</sup>	Max. <sup>a</sup>
<i>FOR_SH</i> <sup>b</sup>	0.06	0.10	0.00	0.49
<i>ICR</i>	0.08	0.12	0.00	0.37
<i>D_Imputation</i>	0.69	0.46	0.00	1.00
<i>ROE</i>	0.06	0.14	-0.49	0.42
<i>SIZE</i>	15.51	1.17	13.30	18.80
<i>BOARD</i>	0.26	0.14	0.06	0.69
<i>DEBT</i>	0.39	0.15	0.09	0.78
<i>MB</i>	1.82	1.36	0.21	7.44
<i>DIV</i>	0.20	0.33	0.00	1.67

Note: <sup>a</sup> Minimum and maximum values are restrained to the 1% and 99% percentile values, respectively.

<sup>b</sup> *FOR\_SH*: the number of common shares owned by foreign shareholders ÷ the number of total common shares outstanding; *ICR*: imputation credit per share ÷ cash dividends per share; *D\_Imputation*: a dummy variable that equals to one if the sample year is in 1998 and after, and zero otherwise; *ROE*: net income ÷ average equity; *SIZE*: the natural log value of beginning assets; *BOARD*: the number of common shares owned by directors ÷ the number of total common shares outstanding; *DEBT*: total debt ÷ total assets; *MB*: market value of equity ÷ book value of equity; *DIV*: cash dividends per share ÷ earnings per share.

**Table 3. Descriptive Statistics for Selected Variables -- Effect of Alternative Minimum Tax (N = 995)**

	Mean	Std. Dev.	Min. <sup>c</sup>	Max. <sup>c</sup>
<i>FOR_SH</i> <sup>a</sup>	0.09	0.12	0.00	0.55
<i>AMT</i> <sup>b</sup>	0.01	0.02	0.00	0.08
<i>D_AMT</i>	0.52	0.50	0.00	1.00
<i>ROE</i>	0.07	0.16	-0.90	0.46
<i>SIZE</i>	15.63	1.30	12.75	19.20
<i>BOARD</i>	0.23	0.13	0.06	0.67
<i>DEBT</i>	0.37	0.16	0.07	0.84
<i>MB</i>	1.51	1.11	0.31	6.63
<i>DIV</i>	0.37	0.36	0.00	1.59

Note: <sup>a</sup> See Table 2 for the definitions of other independent variables.

<sup>b</sup> *AMT*: the amount of AMT paid scaled by pretax income; *D\_AMT*: a dummy variable that equals to one if the sample year is in 2006 and after, and zero otherwise.

<sup>c</sup> Minimum and maximum values are restrained to the 1% and 99% percentile values, respectively.

**Table 4. Descriptive Statistics for Selected Variables -- Effect of Corporate Tax Rate Reduction (N = 6,100)**

	Mean	Std. Dev.	Min. <sup>c</sup>	Max. <sup>c</sup>
<i>FOR_SH</i> <sup>a</sup>	0.08	0.12	0.00	0.57
<i>ETR_Decr</i> <sup>b</sup>	0.24	0.43	0.00	1.00
<i>D_Decr</i>	0.62	0.49	0.00	1.00
<i>ROE</i>	0.04	0.18	-0.87	0.41
<i>SIZE</i>	15.14	1.34	12.38	19.30
<i>BOARD</i>	0.23	0.14	0.05	0.70
<i>DEBT</i>	0.36	0.17	0.04	0.83
<i>MB</i>	1.55	1.11	0.31	6.86
<i>DIV</i>	0.45	0.45	0.00	2.50

Note: <sup>a</sup> See Table 2 for the definitions of other independent variables.

<sup>b</sup> *ETR\_Decr*: a dummy variable for firms whose effective tax rates decrease after the corporate tax rate reduction and for the sample years in 2010 and after, and zero otherwise; *D\_Decr*: a dummy variable that equals to one if the sample year is in 2010 and after, and zero otherwise.

<sup>c</sup> Minimum and maximum values are restrained to the 1% and 99% percentile values, respectively.

(1) to (3), respectively. The mean values of *FOR\_SH* during the three sample periods of Equation (1) to (3) are approximately 0.06, 0.09 and 0.08, respectively, suggesting that foreign shareholders, in aggregate, are not the majority of investors for Taiwanese listed firms and thus increasing foreign ownership can be an important policy for the Taiwanese Government to promote the international visibility of the Taiwan Stock Exchange.

Tables 5, 6, and 7 present correlation coefficients for the dependent and independent variables of Equations (1) to (3), respectively. Table 5 shows *ICR* is significantly and negatively correlated to *FOR\_SH*, consistent with our prediction of hypothesis H1, suggesting that firms with greater imputation credit rates tend to have lower foreign ownership beginning with the year the imputation system was implemented. Tables 6 and 7, however, show that the *AMT* is significantly and positively related to *FOR\_SH*, and *ETR\_Decr* is positively but insignificantly related to *FOR\_SH*, inconsistent with hypotheses H2 and H3. As the univariate relationships do not control for other factors that may influence foreign ownership, the results of correlation analyses may be subject to the omitted variable problem. Therefore, we further conduct fixed-effects estimations for Equations (1) to (3) to test our hypotheses.

## 4.2 Regression Results

Tables 8, 9, and 10 present empirical results of the fixed-effects estimation for Equations (1) to (3), respectively. The Hausman  $\chi^2$  statistics for testing the consistency of random-effects estimation of the three equations are 27.17 (*p*-value < 0.0001), 91.37

**Table 5. Correlation Analysis of Selected Variables -- Effect of Imputation Systems (*p*-value in parentheses) (*N* = 3,265)**

	<i>FOR_SH</i>	<i>ICR</i>	<i>D_Imputation</i>	<i>ROE</i>	<i>SIZE</i>	<i>BOARD</i>	<i>DEBT</i>	<i>MB</i>	<i>DIV</i>
<i>FOR_SH</i>	1								
<i>ICR</i>		-0.04 (0.01)							
<i>D_Imputation</i>		-0.14 (0.00)	0.60 (0.00)		1				
<i>ROE</i>		0.18 (0.00)	0.27 (0.00)	-0.18 (0.00)		1			
<i>SIZE</i>		0.37 (0.00)	-0.12 (0.00)	-0.04 (0.03)	0.00 (0.82 )		1		
<i>BOARD</i>		0.01 (0.60)	0.16 (0.00)	-0.02 (0.25)	0.24 (0.00)	-0.20 (0.00)		1	
<i>DEBT</i>		-0.10 (0.00)	-0.14 (0.00)	0.09 (0.00)	-0.26 (0.00)	0.23 (0.00)	-0.04 (0.04)		1
<i>MB</i>		0.22 (0.00)	-0.10 (0.00)	-0.49 (0.00)	0.62 (0.00)	-0.03 (0.10)	0.19 (0.00)	-0.18 (0.00)	
<i>DIV</i>		0.13 (0.00)	0.47 (0.00)	0.18 (0.00)	0.28 (0.00)	0.09 (0.00)	0.17 (0.00)	-0.18 (0.00)	-0.01 (0.58)

Note: See Table 2 for the definitions of variables.

**Table 6. Correlation Analysis of Selected Variables -- Effect of Alternative Minimum Tax (p-value in parentheses) (N = 995)**

	FOR_SH	AMT	D_AMT	ROE	SIZE	BOARD	DEBT	MB	DIV
FOR_SH	1								
AMT	0.10 (0.00)	1							
D_AMT	0.13 (0.00)	0.54 (0.00)	1						
ROE	0.25 (0.00)	0.03 (0.33)	-0.04 (0.19)	1					
SIZE	0.41 (0.00)	0.04 (0.16)	0.03 (0.28)	0.17 (0.00)	1				
BOARD	-0.15 (0.00)	-0.06 (0.07)	-0.06 (0.06)	0.05 (0.14)	-0.28 (0.00)	1			
DEBT	-0.10 (0.00)	-0.11 (0.00)	-0.15 (0.00)	-0.15 (0.00)	0.21 (0.00)	-0.13 (0.00)	1		
MB	0.25 (0.00)	-0.03 (0.32)	-0.07 (0.02)	0.62 (0.00)	0.08 (0.02)	0.00 (0.88)	-0.03 (0.27)	1	
DIV	0.30 (0.00)	0.12 (0.00)	0.10 (0.00)	0.44 (0.00)	0.16 (0.00)	0.09 (0.01)	-0.25 (0.00)	0.20 (0.00)	1

Note: See Table 3 for the definitions of variables.

**Table 7. Correlation Analysis of Selected Variables -- Effect of Corporate Tax Rate Reduction (p-value in parentheses) (N = 6,100)**

	FOR_SH	ETR_Decr	D_Decr	ROE	SIZE	BOARD	DEBT	MB	DIV
FOR_SH	1								
ETR_Decr	0.02 (0.21)	1							
D_Decr	-0.01 (0.28)	0.44 (0.00)	1						
ROE	0.19 (0.00)	0.11 (0.00)	0.08 (0.00)	1					
SIZE	0.54 (0.00)	0.05 (0.00)	0.03 (0.01)	0.22 (0.00)	1				
BOARD	-0.18 (0.00)	0.01 (0.64)	-0.02 (0.07)	0.03 (0.02)	-0.19 (0.00)	1			
DEBT	-0.02 (0.11)	0.01 (0.31)	-0.01 (0.50)	-0.09 (0.00)	0.18 (0.00)	-0.02 (0.07)	1		
MB	0.12 (0.00)	0.06 (0.00)	0.10 (0.00)	0.46 (0.00)	-0.04 (0.00)	0.05 (0.00)	-0.03 (0.01)	1	
DIV	0.18 (0.00)	0.09 (0.00)	0.07 (0.00)	0.51 (0.00)	0.19 (0.00)	0.03 (0.01)	-0.22 (0.00)	0.21 (0.00)	1

Note: See Table 4 for the definitions of variables

(*p*-value < 0.0001), and 81.45 (*p*-value < 0.0001), suggesting the random-effects models may be inconsistent. Accordingly, we only report the fixed-effects estimation results.

Consistent with H1, the coefficient on *ICR* is significantly negative (*p*-value < 0.05) in Table 8, indicating that, *ceteris paribus*, firms with higher imputation credit rates tend to have lower foreign ownership after the implementation of the imputation

**Table 8. Regression Results of Foreign Ownership Model -- Effect of Imputation Systems (*N* = 3,265)**

$$FOR\_SH_{it} = \alpha_0 + \alpha_1 ICR_{it} + \alpha_2 D\_Imputation_{it} + \alpha_3 ROE_{it} + \alpha_4 SIZE_{it} + \alpha_5 BOARD_{it} + \alpha_6 DEBT_{it} + \alpha_7 MB_{it} + \alpha_8 DIV_{it} + \varepsilon_{it} \quad (1)$$

Variables <sup>a</sup>	Predicted Sign	Coeff.	Std.	t-stat.	p-value
<i>Intercept</i>	?	-0.51***	0.05	-9.51	0.00
<i>ICR</i>	-	-0.03**	0.01	-2.21	0.03
<i>D_Imputation</i>	?	-0.02***	0.003	-6.55	0.00
<i>ROE</i>	+	0.02	0.01	1.49	0.14
<i>SIZE</i>	+	0.03***	0.003	10.26	0.00
<i>BOARD</i>	?	0.06***	0.01	4.06	0.00
<i>DEBT</i>	-	-0.02*	0.01	-1.83	0.07
<i>MB</i>	+	0.0001	0.001	0.11	0.92
<i>DIV</i>	?	0.01***	0.003	2.55	0.01
<i>R</i> <sup>2</sup>		0.82			

Note: <sup>a</sup> See Table 2 for the definitions of variables.

\* significant at *p* < 0.10; \*\* significant at *p* < 0.05; \*\*\* significant at *p* < 0.01.

**Table 9. Regression Results of Foreign Ownership Model -- Effect of Alternative Minimum Tax (*N* = 995)**

$$FOR\_SH_{it} = \beta_0 + \beta_1 AMT_{it} + \beta_2 D\_AMT_{it} + \beta_3 ROE_{it} + \alpha_4 SIZE_{it} + \beta_5 BOARD_{it} + \beta_6 DEBT_{it} + \beta_7 MB_{it} + \beta_8 DIV_{it} + \varepsilon_{it} \quad (2)$$

Variables <sup>a</sup>	Predicted Sign	Coeff.	Std.	t-stat.	p-value
<i>Intercept</i>	?	-0.47***	0.13	-3.58	0.00
<i>AMT</i>	-	-0.14*	0.08	-1.77	0.08
<i>D_AMT</i>	?	0.02***	0.004	4.88	0.00
<i>ROE</i>	+	-0.01	0.01	-0.99	0.32
<i>SIZE</i>	+	0.04***	0.01	4.36	0.00
<i>BOARD</i>	?	-0.05	0.04	-1.27	0.21
<i>DEBT</i>	-	-0.04	0.03	-1.36	0.18
<i>MB</i>	+	0.01*	0.003	1.92	0.06
<i>DIV</i>	?	0.002	0.01	0.21	0.83
<i>R</i> <sup>2</sup>		0.84			

Note: <sup>a</sup> See Table 3 for the definitions of variables.

\* significant at *p* < 0.10; \*\* significant at *p* < 0.01.

**Table 10. Regression Results of Foreign Ownership Model -- Effect of Corporate Tax Rate Reduction ( $N = 6,100$ )**

$$FOR\_SH_{it} = \gamma_0 + \gamma_1 ETR\_Decr_{it} + \gamma_2 D\_Recr_{it} + \gamma_3 ROE_{it} + \gamma_4 SIZE_{it} + \gamma_5 BOARD_{it} + \gamma_6 DEBT_{it} + \gamma_7 MB_{it} + \gamma_8 DIV_{it} + \varepsilon_{it} \quad (3)$$

Variables <sup>a</sup>	Predicted Sign	Coeff.	Std.	t-stat.	p-value
<i>Intercept</i>	?	-0.34***	0.04	-7.78	0.00
<i>ETR_Degr</i>	+	0.01***	0.002	2.51	0.01
<i>D_Degr</i>	?	-0.003**	0.001	-2.2	0.03
<i>ROE</i>	+	-0.01	0.005	-1.55	0.12
<i>SIZE</i>	+	0.02***	0.003	8.3	0.00
<i>BOARD</i>	?	0.02	0.01	1.6	0.11
<i>DEBT</i>	-	-0.02*	0.01	-1.89	0.06
<i>MB</i>	+	0.001*	0.0007	1.7	0.09
<i>DIV</i>	?	-0.0001	0.002	-0.06	0.95
<i>R</i> <sup>2</sup>			0.92		

Note: <sup>a</sup> See Table 4 for the definitions of variables.

\* significant at  $p < 0.10$ ; \*\* significant at  $p < 0.05$ ; \*\*\* significant at  $p < 0.01$ .

system. Consistent with our hypothesis H2, the coefficient on *AMT* is negative and significant (*p*-value  $< 0.1$ ), suggesting that, *ceteris paribus*, firms paying a higher alternative minimum tax tend to have lower foreign ownership after the enactment of the *AMT*. In contrast, the coefficient on *ETR\_Degr* is significantly positive (*p*-value  $< 0.01$ ), lending support to our hypothesis H3 that, *ceteris paribus*, firms whose effective tax rates decreased after the 2010 corporate tax rate reduction tend to have greater foreign ownership in the year of 2010 and thereafter.

We further calculate the economic significance of the effect of the three tax reforms on corporate foreign ownership based on the regression coefficients of *ICR*, *AMT* and *ETR\_Degr* in Tables 8, 9 and 10. Using the average percentages of foreign ownership of each firm in the year before the enactment of the three tax reforms as the baseline percentages, our estimates show that the enactment of the imputation system and the *AMT*, on average, decreases the baseline percentage of foreign ownership by about 4.5%<sup>6</sup> and 2.8%,<sup>7</sup> respectively, and the 2010 corporate tax rate reduction increases the baseline percentage by about 13%.<sup>8</sup> Overall, these results suggest that the effects of the three tax reforms on foreign ownership are not trivial.

<sup>6</sup> = [The coefficient on *ICR* (-0.03)  $\times$  The average value of *ICR* 1998-2002 (0.12)]  $\div$  The average value of *FOR\_SH* 1997 (0.08).

<sup>7</sup> = [The coefficient on *AMT* (-0.14)  $\times$  The average value of *AMT* 2006-2008 (0.02)]  $\div$  The average value of *FOR\_SH* 2005 (0.10).

<sup>8</sup> = The coefficient on *ETR\_Degr* (0.01)  $\div$  The average value of *FOR\_SH* 2009 (0.077).

Taken together, the empirical results provide evidence supporting the notion that the tax clientele effect remains pronounced under the imputation system regime. The imputation system-related tax reforms of this study changed the relative overall tax costs of dividend income between foreign and domestic shareholders, resulting in the changes in the ownership structure between the two types of shareholders. Under the imputation system, increasing the tax rate at the corporate level does not increase the overall tax costs of domestic shareholders; it does, however, increase the overall tax costs of foreign shareholders, resulting in the decrease in foreign ownership of Taiwanese listed firms. In contrast, decreasing the tax rate at the corporate level does not decrease the overall tax costs of domestic shareholders; it does, however, decrease the overall tax costs for foreign shareholders, resulting in an increase in foreign ownership.

The results of the control variables are generally consistent with our expectations. The three time period dummy variables, *D\_Imputation*, *D\_AMT* and *D\_Decr*, are all significant, providing a control for the differences in potential macro-level factors before and after the three imputation system-related tax reforms during the sample periods. The coefficients on *SIZE* are all significantly positive in Tables 8, 9 and 10, and the coefficients on *MB* are all positive in Tables 8, 9 and 10, and significant in Tables 9 and 10. Furthermore, the coefficients on *DEBT* are all negative in Tables 8, 9 and 10 and significant in Tables 8 and 10. The results are consistent with the findings of prior studies in which foreign investors tend to have disproportionately high holdings of large firms and growth firms and are less likely to invest in firms with high financial risk (Dahlquist and Robertsson 2001; Elkinawy 2005; Kang and Stulz 1997).

### 4.3 Supplemental Tests

We conduct several additional analyses to exclude possible noise in our empirical tests and further investigate the impact of investor heterogeneity on the tax clientele effect of foreign ownership.

#### 4.3.1 Changing the Sample Periods

The sample periods for Equations (1) and (3) are 1994 to 2002 and 2008 to 2012, respectively. Since the post-tax reform periods (5 years / 3 years) for the two Equations are longer than the pre-tax reform periods (4 years / 2 years) we changed the sample periods to 1994 to 2001 and 2008 to 2011 for Equations (1) and (3), respectively, to exclude the potentially over-sampled problems from the post-reform periods. The untabulated regression results show that the coefficient on *ICR* remains significantly negative in Equation (1) and the coefficient on *ETR\_Decr* remains significantly positive in Equation (3), consistent with the predictions of hypotheses H1 and H3. The results of the other variables in the regression

models are also qualitatively similar to those in Tables 8 and 10. Therefore, our conclusions are robust to the alternative specifications of sample periods.

#### 4.3.2 Excluding Firms without Foreign Ownership

Foreign investors may have a disproportionate preference for particular characteristics of firms (Dahlquist and Robertsson 2001; Kang and Stulz 1997) and may not invest in certain firms. To exclude the potential noise arising from the firms in which foreign investors may not choose to invest, we eliminated firms without foreign ownership during the whole sample period (1994 to 2012) from the samples for Equations (1) to (3). The samples were reduced to 3,109, 987, and 5,999 firm-year observations for Equations (1) to (3), respectively. The untabulated regression results show that the coefficient on *ICR* remains significantly negative in Equation (1), the coefficient on *AMT* remains significantly negative in Equation (2), and the coefficient on *ETR\_Decr* remains significantly positive in Equation (3). Thus, our conclusions for hypotheses H1 to H3 still hold after eliminating firms with zero foreign ownership. The results of the other variables in the regression models are also qualitatively similar to those in Tables 8, 9 and 10. Therefore, our conclusions are robust to the alternative specifications of sample selections.

#### 4.3.3 Distinguishing Foreign Institutional Investors and Foreign Individual Investors

Prior research suggests investor heterogeneity may have different levels of investor sophistication and information asymmetry (Bartov and Bodnar 1996; Rajgopal and Venkatachalam 1997; Richardson 1997). Therefore, we further separate foreign ownership into foreign institutional ownership and foreign individual ownership to investigate whether the effects of the three imputation system-related tax reforms are different across the two types of foreign investors. Prior studies suggest institutional investors are more sophisticated and have less information asymmetry. Therefore, we conjecture that the results will be more pronounced in the foreign institutional ownership sample than in the foreign individual ownership sample.

Tables 11, 12 and 13 present the regression results of Equations (1) to (3), respectively, for foreign institutional ownership (in the left half of the tables) and foreign individual ownership (in the right half of the tables). The results are consistent with our predictions. The coefficients on *ICR* and *AMT* for foreign institutional ownership are significantly negative in Tables 11 and 12, respectively, and the coefficient on *ETR\_Decr* is significantly positive in Table 13. In contrast, all the coefficients on *ICR*, *AMT*, and *ETR\_Decr* for foreign individual ownership are not significant in Tables 11, 12 and 13, respectively. The results suggest that our findings on the tax clientele effect of foreign ownership are mainly driven

by the changes in the level of foreign institutional investors rather than by the changes in foreign individual investors. This result is consistent with the findings of prior studies that institutional shareholders are more sophisticated investors and thus are more able to adjust their ownership levels in response to changes in the tax system.

**Table 11. Regression Results of Foreign Ownership Model -- Effect of Imputation Systems ( $N = 2,811^a$ ) -- Foreign Institutional Shareholders vs. Foreign Individual Shareholders**

Dependent Variable <sup>b</sup>	Foreign Institutional Ownership				Foreign Individual Ownership			
	Coeff.	Std.	t-stat.	p-value	Coeff.	Std.	t-stat.	p-value
<i>Intercept</i>	-0.51***	0.05	-9.60	0.00	-0.01	0.02	-0.45	0.65
<i>ICR</i>	-0.03**	0.01	-2.19	0.03	0.002	0.004	0.51	0.61
<i>D_Imputation</i>	-0.01***	0.003	-3.73	0.00	-0.01***	0.001	-7.95	0.00
<i>ROE</i>	0.01	0.01	0.85	0.40	-0.01**	0.003	-2.02	0.04
<i>SIZE</i>	0.03***	0.003	10.46	0.00	0.001	0.001	0.79	0.43
<i>BOARD</i>	0.05***	0.01	3.35	0.00	-0.005	0.005	-0.98	0.33
<i>DEBT</i>	-0.04***	0.01	-3.80	0.00	-0.0001	0.004	-0.03	0.98
<i>MB</i>	-0.0003	0.001	-0.29	0.77	0.0004	0.0003	1.14	0.25
<i>DIV</i>	0.01***	0.003	2.76	0.01	-0.001	0.001	-0.59	0.56
R2	0.83				0.84			

Note: <sup>a</sup> We delete 454 observations without foreign ownership because their ownership cannot be classified into either of the two types of foreign ownership.

<sup>b</sup> See Table 2 for the definitions of variables.

\*\* significant at  $p < 0.05$ ; \*\*\* significant at  $p < 0.01$ .

**Table 12. Regression Results of Foreign Ownership Model -- Effect of Alternative Minimum Tax ( $N = 995$ ) -- Foreign Institutional Shareholders vs. Foreign Individual Shareholders**

Dependent Variable <sup>a</sup>	Foreign Institutional Ownership				Foreign Individual Ownership			
	Coeff.	Std.	t-stat.	p-value	Coeff.	Std.	t-stat.	p-value
<i>Intercept</i>	-0.5***	0.13	-3.93	0.00	1.01	0.67	1.51	0.13
<i>AMT</i>	-0.18***	0.07	-2.46	0.01	-0.21	0.47	-0.45	0.65
<i>D_AMT</i>	0.02**	0.004	4.93	0.00	-0.03	0.02	-1.13	0.26
<i>ROE</i>	-0.01	0.01	-0.69	0.49	0.11	0.09	1.19	0.23
<i>SIZE</i>	0.04***	0.01	4.69	0.00	-0.07	0.04	-1.56	0.12
<i>BOARD</i>	-0.05	0.04	-1.37	0.17	0.02	0.22	0.09	0.93
<i>DEBT</i>	-0.05	0.03	-1.56	0.12	0.12	0.15	0.80	0.42
<i>MB</i>	0.01*	0.003	1.74	0.08	0.00	0.01	0.24	0.81
<i>DIV</i>	-0.0003	0.01	-0.04	0.97	0.05	0.04	1.33	0.18
R2	0.84				0.94			

Note: <sup>a</sup> See Table 3 for the definitions of variables.

\* significant at  $p < 0.10$ ; \*\*\* significant at  $p < 0.01$ .

**Table 13. Regression Results of Foreign Ownership Model -- Effect of Corporate Tax Rate Reduction ( $N = 6,097^a$ ) -- Foreign Institutional Shareholders and Foreign Individual Shareholders**

Dependent Variable <sup>b</sup>	Foreign Institutional Ownership				Foreign Individual Ownership			
	Coeff.	Std.	t-stat.	p-value	Coeff.	Std.	t-stat.	p-value
<i>Intercept</i>	-0.34***	0.04	-8.04	0.00	0.01*	0.01	1.88	0.06
<i>ETR_Decr</i>	0.01***	0.002	2.97	0.00	0.0002	0.0002	1.01	0.31
<i>D_Decr</i>	0.00	0.001	-0.56	0.57	-0.0004**	0.0002	-2.35	0.02
<i>ROE</i>	-0.01*	0.005	-1.72	0.08	-0.0003	0.001	-0.51	0.61
<i>SIZE</i>	0.02***	0.003	8.53	0.00	-0.001*	0.0003	-1.91	0.06
<i>BOARD</i>	0.02**	0.01	2.11	0.03	-0.003**	0.001	-2.39	0.02
<i>DEBT</i>	-0.01*	0.01	-1.80	0.07	0.001	0.001	0.86	0.39
<i>MB</i>	0.00	0.001	0.08	0.94	0.0001	0.0001	1.00	0.32
<i>DIV</i>	0.00	0.002	0.31	0.76	0.0001	0.0002	0.71	0.48
<i>R</i> <sup>2</sup>	0.92				0.87			

Note: <sup>a</sup> We delete 3 observations without foreign ownership because their ownership cannot be classified into either of the two types of foreign ownership.

<sup>b</sup> See Table 4 for the definitions of variables.

\* significant at  $p < 0.10$ ; \*\* significant at  $p < 0.05$ ; \*\*\* significant at  $p < 0.01$ .

#### 4.3.4 Dividing Foreign Institutional Investors into Active Group and Less Active Group

Tables 11 to 13 suggest that foreign institutional investors are more sophisticated investors in the stock market. Foreign institutional investors, however, consist of foreign corporations, foreign financial institutions and foreign trust funds. To explore whether different types of foreign institutional investors may respond to the tax reforms to different extents, we further divide foreign institutional investors into an active group and a less active group. We classify foreign trust funds as a less active group as managers of trust funds (e.g., pension fund) are more likely to pursue a target long-term return on their portfolios and, hence, may be less actively engaged in daily trading. In contrast, we classify foreign corporations and foreign financial institutions as an active group as they are more likely to hold trading portfolios and may actively engage in daily trading. We conjecture that the effects of tax reforms on foreign ownership would be more salient for the active group of foreign investors.

Tables 14, 15 and 16 show the regression results of Equations (1) ~ (3) for the active group of foreign ownership (in the left half of the tables) and the less active group of foreign ownership (in the right half of the tables). For the less active group of foreign ownership, all the coefficients on *ICR*, *AMT*, and *ETR\_Decr* are not significant in all three tables. However, for the active group of foreign investors, the coefficient on *ICR*

**Table 14. Regression Results of Foreign Ownership Model -- Effect of Imputation Systems ( $N = 2,805^a$ ) -- Active Group vs. Less Active Group**

Dependent Variable <sup>b</sup>	Active Group				Less Active Group			
	(Foreign Corporation Ownership and Foreign Financial Institution Ownership)				(Trust Fund)			
	Coeff.	Std.	t-stat.	p-value	Coeff.	Std.	t-stat.	p-value
<i>Intercept</i>	-0.27***	0.04	-6.10	0.00	-0.21***	0.02	-8.35	0.00
<i>ICR</i>	-0.02*	0.01	-1.82	0.07	-0.01	0.01	-1.61	0.11
<i>D_Imputation</i>	-0.003	0.002	-1.28	0.20	-0.01***	0.001	-5.06	0.00
<i>ROE</i>	0.005	0.01	0.61	0.54	0.01	0.005	1.30	0.20
<i>SIZE</i>	0.02***	0.003	6.48	0.00	0.01***	0.001	9.29	0.00
<i>BOARD</i>	0.07***	0.01	6.04	0.00	-0.02***	0.01	-3.12	0.00
<i>DEBT</i>	-0.03***	0.01	-3.40	0.00	-0.01	0.01	-1.16	0.25
<i>MB</i>	-0.001	0.0009	-1.30	0.19	0.001	0.0005	1.62	0.11
<i>DIV</i>	0.01**	0.003	2.21	0.03	0.002*	0.001	1.70	0.09
<i>R</i> <sup>2</sup>	0.86				0.58			

Note: <sup>a</sup> We delete 460 observations without foreign ownership because their ownership cannot be classified into either of the two types of foreign ownership.

<sup>b</sup> See Table 2 for the definitions of variables.

\* significant at  $p < 0.10$ ; \*\* significant at  $p < 0.05$ ; \*\*\* significant at  $p < 0.01$ .

**Table 15. Regression Results of Foreign Ownership Model -- Effect of Alternative Minimum Tax ( $N = 989^a$ ) -- Active Group vs. Less Active Group**

Dependent Variable <sup>b</sup>	Active Group				Less Active Group			
	(Foreign Corporation Ownership and Foreign Financial Institution Ownership)				(Trust Fund)			
	Coeff.	Std.	t-stat.	p-value	Coeff.	Std.	t-stat.	p-value
<i>Intercept</i>	-0.05	0.09	-0.57	0.57	-0.36***	0.09	-3.96	0.00
<i>AMT</i>	-0.09	0.06	-1.42	0.16	-0.06	0.07	-0.90	0.37
<i>D_AMT</i>	0.001	0.003	0.29	0.77	0.02***	0.003	4.91	0.00
<i>ROE</i>	-0.01	0.01	-0.74	0.46	-0.001	0.01	-0.04	0.97
<i>SIZE</i>	0.01**	0.01	2.39	0.02	0.03***	0.01	4.42	0.00
<i>BOARD</i>	-0.01	0.03	-0.19	0.85	-0.01	0.03	-1.27	0.20
<i>DEBT</i>	-0.03*	0.02	-1.72	0.09	-0.02	0.02	-1.04	0.30
<i>MB</i>	0.01***	0.002	2.77	0.01	0.001	0.002	0.26	0.80
<i>DIV</i>	-0.002	0.01	-0.40	0.69	0.001	0.01	0.15	0.88
<i>R</i> <sup>2</sup>	0.84				0.78			

Note: <sup>a</sup> We delete 6 observations without foreign ownership because their ownership cannot be classified into either of the two types of foreign ownership.

<sup>b</sup> See Table 3 for the definitions of variables.

\* significant at  $p < 0.10$ ; \*\* significant at  $p < 0.05$ ; \*\*\* significant at  $p < 0.01$ .

is significantly negative in Table 14, and the coefficient on *ETR\_Decr* is significantly positive in Table 16. The results are consistent with our conjecture that corporate and financial institutional investors respond to the changes in tax reforms more actively than trust fund institutional investors.

#### 4.3.5 Considering the Probability of Distributing Dividends

The imputation system causes a change in the relative tax rate on dividends between domestic and foreign shareholders. However, if a firm does not distribute dividends, the imputation system may not affect the relative tax cost between domestic and foreign shareholders. Hence, domestic and foreign shareholders may not adjust their relative ownership if they do not expect firms to distribute dividends. To address this concern, we conduct an additional analysis by incorporating the expected probability of dividend payout in our regression models.

We first construct the probit regression model to estimate the expected probability of firms' dividend payout. The dependent variable of the probit regression equals one if the firm has dividend payout and zero otherwise. We include firm size,<sup>9</sup> sales growth,<sup>10</sup>

**Table 16. Regression Results of Foreign Ownership Model -- Effect of Corporate Tax Rate Reduction ( $N = 6,068^a$ ) -- Active Group vs. Less Active Group**

Dependent Variable <sup>b</sup>	Active Group				Less Active Group			
	(Foreign Corporation Ownership and Foreign Financial Institution Ownership)				(Trust Fund)			
	Coeff.	Std.	t-stat.	p-value	Coeff.	Std.	t-stat.	p-value
<i>Intercept</i>	-0.17***	0.03	-5.75	0.00	-0.15***	0.04	-3.62	0.00
<i>ETR_Decr</i>	0.003***	0.001	2.37	0.02	0.003	0.002	1.64	0.10
<i>D_Decr</i>	-0.002**	0.001	-2.03	0.04	0.001	0.001	0.91	0.36
<i>ROE</i>	-0.004	0.003	-1.41	0.16	-0.001	0.004	-0.33	0.74
<i>SIZE</i>	0.01***	0.002	5.90	0.00	0.013***	0.003	4.49	0.00
<i>BOARD</i>	0.03***	0.01	4.32	0.00	-0.010	0.01	-1.04	0.30
<i>DEBT</i>	-0.003	0.01	-0.60	0.55	-0.012	0.01	-1.58	0.11
<i>MB</i>	0.001**	0.0005	2.08	0.04	-0.001	0.001	-1.36	0.18
<i>DIV</i>	0.002	0.001	1.57	0.12	-0.001	0.001	-1.56	0.12
<i>R</i> <sup>2</sup>	0.93				0.89			

Note: <sup>a</sup> We delete 32 observations without foreign ownership because their ownership cannot be classified into either of the two types of foreign ownership.

<sup>b</sup> See Table 4 for the definitions of variables.

\*\* significant at  $p < 0.05$ ; \*\*\* significant at  $p < 0.01$ .

<sup>9</sup> = natural log value of total assets.

<sup>10</sup> = changes in sales ÷ vsales from the previous year.

return on equity, debt ratio, operating cash flow,<sup>11</sup> quick ratio and industry membership to account for factors associated with whether firms have dividend payout (Agrawal and Jayaraman 1994; Fama and French 2001; Jensen 1986; Rozeff 1982). Using the cut-off point of 0.5 to classify whether firms have dividend payout, the average correct ratio is about 84%, suggesting the model has a high goodness of fit.

Based on the regression coefficients of the probit model, we use the financial statement data at the year preceding each of the sample years to calculate the expected probability of whether the firm will have dividend payout.  $P\_DIV$  is set to one if the estimated probability is greater than or equal to 0.5, and zero otherwise. We then incorporate  $P\_DIV$  into the foreign ownership regression models to control for the effects of the expected probability of firms' dividend payout. We construct Equations (4) ~ (6) as follows.

$$\begin{aligned} FOR\_SH_{it} = & \alpha_{0i} + \alpha_1 ICR_{it} + \alpha_2 D\_Imputation_{it} + \alpha_3 P\_DIV_{it} + \alpha_4 D\_Imputation \times \\ & P\_DIV_{it} + \alpha_5 ROE_{it} + \alpha_6 SIZE_{it} + \alpha_7 BOARD_{it} + \alpha_8 DEBT_{it} + \alpha_9 MB_{it} + \\ & \alpha_{10} DIV_{it} + \varepsilon_{it} \end{aligned} \quad (4)$$

$$\begin{aligned} FOR\_SH_{it} = & \beta_{0i} + \beta_1 ICR_{it} + \beta_2 AMT_{it} + \beta_3 D\_AMT_{it} + \beta_4 P\_DIV_{it} + \beta_5 D\_AMT \times \\ & P\_DIV_{it} + \beta_6 ROE_{it} + \alpha_7 SIZE_{it} + \beta_8 BOARD_{it} + \beta_9 DEBT_{it} + \beta_{10} MB_{it} + \\ & \beta_{11} DIV_{it} + \varepsilon_{it} \end{aligned} \quad (5)$$

$$\begin{aligned} FOR\_SH_{it} = & \gamma_{0i} + \gamma_1 ICR_{it} + \gamma_2 AMT_{it} + \gamma_3 ETR\_Decr_{it} + \gamma_4 D\_Decr_{it} + \gamma_5 P\_DIV_{it} + \\ & \gamma_6 D\_Decr \times P\_DIV_{it} + \gamma_7 ROE_{it} + \gamma_8 SIZE_{it} + \gamma_9 BOARD_{it} + \gamma_{10} DEBT_{it} + \\ & \gamma_{11} MB_{it} + \gamma_{12} DIV_{it} + \varepsilon_{it} \end{aligned} \quad (6)$$

We conjecture that the tax reforms will have a greater impact on foreign ownership for those firms which investors expect to have dividends payout. Accordingly, we expect  $\alpha_4$  to be negative,  $\beta_5$  to be negative, and  $\gamma_6$  to be positive. Further, although we examine the effects of the three tax reforms in three different sample periods, the effects of the previous tax reforms may remain present in the following sample periods. To address this concern, we include  $ICR$  in Equation (5) to control for the effect of imputation systems in the *AMT* sample period, and include *ICR* and *AMT* in Equation (6) to control for the effects of imputation systems and the *AMT* in the tax rate reduction sample period.

Table 17 presents the regression results of Equations (4) ~ (6). Table 17 shows that, consistent with our expectations, the coefficient ( $\alpha_4$ ) on  $D\_Imputation \times P\_DIV$  is significantly negative ( $p$ -value = 0.06) and the coefficient ( $\gamma_6$ ) on  $D\_Decr \times P\_DIV$  is significantly positive ( $p$ -value = 0.06). The results support our H1 and H3 after controlling

<sup>11</sup> = operating cash flow ÷ total assets.

**Table 17. Regression Results of Foreign Ownership Model -- Considering the Probability of Dividend Payout**

Variables <sup>a</sup>	Predicted Sign	Coeff.	Std.	t-stat.	p-value	Predicted Sign	Coeff.	Std.	t-stat.	p-value	Predicted Sign	Coeff.	Std.	t-stat.	p-value
<i>Intercept</i>	?	-0.52***	0.05	-9.45	0.00	?	-0.35***	0.13	-2.68	0.01	?	-0.32***	0.05	-6.88	0.00
<i>ICR</i>	—	-0.02*	0.01	-1.86	0.06	—	-0.01	0.02	-0.49	0.62	—	0.00	0.01	0.11	0.92
<i>D_Imputation</i>	?	-0.01***	0.004	-3.75	0.00	—	-0.10	0.07	-1.49	0.14	—	0.02	0.03	0.60	0.55
<i>AMT</i>						?	0.01	0.01	0.47	0.64	+	0.01***	0.002	2.70	0.01
<i>D_AMT</i>											?	-0.01***	0.003	-2.85	0.00
<i>ETR_Decr</i>												0.00	0.003	-0.69	0.49
<i>D_Decr</i>															
<i>P_DIV<sup>b</sup></i>	?	0.00	0.004	0.59	0.55	?	-0.02*	0.01	-1.70	0.09	?	0.00	0.003	-0.69	0.49
<i>D_Imputation × P_DIV</i>	—	-0.01*	0.004	-1.90	0.06	—	0.02	0.01	1.31	0.19	+	0.01*	0.003	1.88	0.06
<i>D_AMT × P_DIV</i>															
<i>D_Decr × P_DIV</i>															
<i>ROE</i>	+	0.02	0.01	1.59	0.11	+	0.01	0.02	0.23	0.82	+	-0.01	0.01	-1.37	0.17
<i>SIZE</i>	+	0.03***	0.003	10.21	0.00	+	0.04***	0.01	4.33	0.00	+	0.02***	0.003	7.32	0.00
<i>BOARD</i>	?	0.06***	0.01	4.03	0.00	?	-0.05	0.04	-1.16	0.25	?	0.02	0.01	1.38	0.17
<i>DEBT</i>	—	-0.03**	0.01	-2.21	0.03	—	-0.05*	0.03	-1.82	0.07	—	-0.01	0.01	-1.58	0.11
<i>MB</i>	+	0.00	0.001	0.18	0.85	+	0.01**	0.003	1.94	0.05	+	0.00*	0.0007	1.89	0.06
<i>DIV</i>	?	0.01***	0.003	2.52	0.01	?	0.00	0.01	0.24	0.81	?	0.00	0.002	-0.17	0.87
<i>R<sup>2</sup></i>											0.84			0.92	

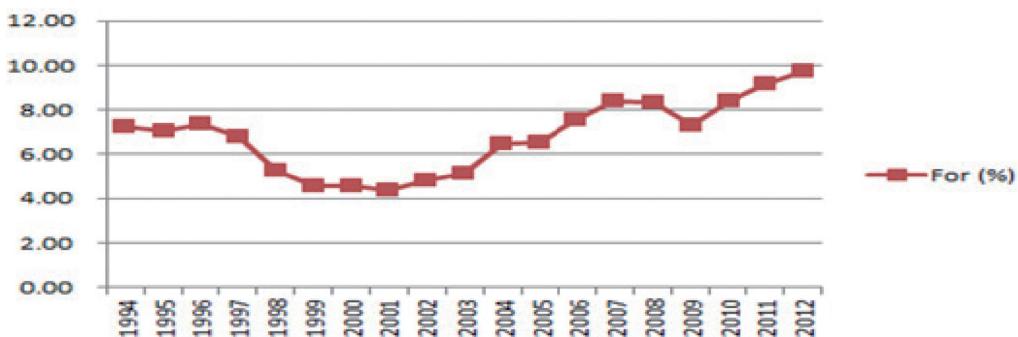
Note:<sup>a</sup> See Tables 2 ~ 4 for the definitions of other variables.

<sup>b</sup> *P\_DIV*: dummy variable equals 1 if the probability of dividend payout is equal to or higher than 0.5 and 0 otherwise.  
\* significant at  $p < 0.10$ ; \*\* significant at  $p < 0.05$ ; \*\*\* significant at  $p < 0.01$ .

for the effects of expected probability of dividend payout. However, the coefficient ( $\beta_5$ ) on  $D\_AMT \times P\_DIV$  is insignificant ( $p$ -value = 0.19), probably due to the fact that only a small percentage of our sample firms are subject to the *AMT* and thus may reduce the estimation efficiency of Equation (5).<sup>12</sup> The signs and significance of coefficients on the other independent variables are qualitatively the same as those in Tables 8 ~ 10. Taken together, our H1 and H3 still hold after controlling for the effects of expected probability of dividend payout as well as the previous tax reforms in the following sample periods.

#### 4.3.6 Time-Series Analysis of Foreign Ownership

In addition to the results of the regression test, we also conduct a time-series analysis to show the changes in foreign ownership during the sample period. Figure 1 depicts the average percentage of foreign ownership of Taiwanese listed and OTC firms from 1994 to 2012. Figure 1 shows that the average percentage of foreign ownership declined from 6.79% (in 1997) to 5.27% in 1998 and increased from 7.32% (in 2009) to 8.37% in 2010. These results are consistent with our expectation that the implementation of the imputation system in 1998 led to a decrease in foreign ownership and the reduction in corporate tax rate in 2010 caused an increase in foreign ownership. The average percentage of foreign ownership, however, increased from 6.57% (in 2005) to 7.57% in 2006, which counters our argument that the implementation of the *AMT* would result in a decline in foreign ownership. The result may be attributable to the fact that only a small fraction of firms are subject to the *AMT*. Therefore, the average foreign ownership of listed and OTC firms did not appear to be affected by the implementation of the *AMT*.



**Figure 1. Average Foreign Ownership Percentage during 1994 ~ 2012**

<sup>12</sup> Based on our calculation, only 15% of our sample firms are subject to the *AMT* and the total amount of *AMT* paid during our *AMT* sample period is about NT\$ 15.9 billion, which is relatively small compared with the annual corporate tax revenue of more than NT\$ 400 billion.

## 5. Conclusions

Foreign ownership in the stock market is often regarded as an important indicator to evaluate the extent of a developing country's economic development and attractiveness to foreign investors. However, few studies have addressed the effects of tax reforms on foreign ownership under imputation systems in emerging economies. Increasing foreign investment in the Taiwanese stock market has long been an important policy goal for Taiwan in its effort to be competitive with comparable Asian countries, such as Korea, Singapore, and Hong Kong.

By examining the effects of the three imputation system-related tax reforms on the foreign ownership of Taiwanese listed firms, we provide evidence that such tax reforms change the relative overall tax costs of domestic and foreign shareholders and, hence, change the foreign ownership of Taiwanese listed firms. After the implementation of the imputation system in 1998, firms with a higher imputation credit rate tend to have a lower percentage of foreign shareholders. Furthermore, after the enactment of the AMT under the imputation system in 2006, firms paying a higher alternative minimum tax tend to have a lower percentage of foreign shareholders. Finally, after the reduction of the corporate income tax rate under the imputation system in 2010, firms for which the effective tax rate decreased tend to have greater percentage of foreign shareholders. Our additional analyses reveal that such changes in foreign ownership mainly resulted from the changes in the levels of foreign institutional investors rather than from such changes in foreign individual investors, suggesting that institutional shareholders are more sophisticated investors and are more able to adjust their ownership level in response to the three imputation system-related tax reforms. In addition, we find that corporate and financial institutional investors respond to changes in tax reforms more actively than trust fund institutional investors.

We also consider that the adjustment of foreign ownership in the three stages of tax reforms may be affected by the effects of investors' expected probability of firms' dividend payout as well as the previous tax reforms in the following sample periods. However, our findings still show that the implementation of an imputation system decreases foreign ownership and the corporate tax rate reduction increases foreign ownership after incorporating the effects in our regression models. Taken together, the results contribute to prior literature by providing evidence supporting the tax clientele theory under the imputation system regime. Lastly, emerging countries can use the tax policy implications of our findings to evaluate the effects of corporate tax reforms on foreign ownership under an imputation system.

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## 我國兩稅合一制及租稅變革對外資股權比例之影響

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### 摘要

本研究探討我國實施兩稅合一制及兩稅合一制下施行最低稅負制及調降營利事業所得稅率對於上市櫃公司外資股權比例之影響。本文的實證結果顯示，兩稅合一制實施後，上市櫃公司稅額扣抵比率愈高者，其外資持股比率下降愈多，符合租稅顧客效果假說。此外，兩稅合一制下施行最低稅負制後，加徵最低稅負之上市櫃公司，其外資股東之持股比率減少與最低稅負加徵之稅額有顯著之正向關係。最後，兩稅合一制下調降營利事業所得稅率後，有效稅率降低之上市櫃公司，其外資股東之持股比率顯著增加。本文的研究發現延伸租稅顧客效果之研究，提供股東的租稅顧客效果於兩稅合一稅制下之實證證據，亦有助於了解兩稅合一制下公司稅制租稅變革的實質稅負效果。

**關鍵詞：**兩稅合一、外資股權、租稅顧客效果、最低稅負制

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數據可用性：本文使用的數據可從公開資料來源取得。

## 1. 研究議題

本研究探討我國實施兩稅合一制及兩稅合一制下施行最低稅負制及調降營利事業所得稅率對於上市櫃公司外資股權比例變動之影響。在我國兩稅合一制之規定下，公司於分派股利所得予股東時亦一併設算可扣抵稅額分配給境內個人股東抵減其綜合所得稅，但外資股東則不適用股利所得之可扣抵稅額，故形成股東因身分別的不同而須負擔不同股利稅負之特有情境。因此，在我國兩稅合一制下實施加稅或減稅政策，對於境內股東與外資股東的最終股利所得稅成本負擔有不同之影響。兩稅合一制下施行最低稅負制，由於加徵之稅額仍可設算為可扣抵稅額供境內股東抵減其綜合所得稅，因此最低稅負制之施行僅增加外資股東之實質租稅負擔。反之，兩稅合一制下，調降營利事業所得稅率也同時減少境內股東的稅額扣抵比率，故外資股東是營利事業所得稅率調降之實質租稅利益受惠者。在租稅顧客效果之理論下，當不同身分股東因稅制改變而對股利稅負影響具有差異性時，股東會依股利之稅後實質所得改變，重新調整其最適之持股比率。因此，本文之研究目的在於以我國特有之租稅制度及其演變，探討在兩稅合一制下實施加稅及減稅之租稅變革對於我國資本市場之股權結構影響是否符合租稅顧客效果之推論。

## 2. 研究假說

### 2.1 兩稅合一制與外資股權比率變動之假說

兩稅獨立課稅制下，股東獲配股利所得之實質稅負受到公司階段之營利事業所得稅及股東階段之綜合所得稅的影響，然 1998 年施行兩稅合一制後，公司階段繳納之營利事業所得稅性質上為境內股東股利稅之預付稅款，於公司分派盈餘予股東時，會一併分配屬於該盈餘之股東可扣抵稅額以供股東抵減綜合所得稅，換言之，稅額扣抵比率愈高之公司，其境內股東獲配之抵稅權亦愈高。惟我國之兩稅合一制排除外資股東適用，因此外資股東之租稅負擔並未因兩稅合一制之施行而減少。本文推論，在租稅顧客效果之假設下，兩稅合一制施行後，基於境內股東可獲得之租稅利益大於外資股東，故境內股東將有誘因於兩稅合一制後由外資股東處取得上市櫃公司之股權，進而使上市櫃公司之股權結構產生變動，故本文提出以下假說：

**H1：其他條件相同下，1998 年施行兩稅合一制後，上市櫃公司稅額扣抵比率愈高者，其外資持股比率愈低。**

## 2.2 最低稅負制與外資股權比率變動之假說

兩稅獨立課稅之國家實施最低稅負制會導致加徵最低稅負之公司的稅後盈餘減少，進而使股東可獲配之股利下降。然而，在兩稅合一制下，境內股東因可獲配股東可扣抵稅額抵減綜合所得稅，因此，即使公司加徵最低稅負，該增納之稅額亦可記入股東可扣抵稅額帳戶中，日後供境內股東抵減個人綜合所得稅，故整體而言，最低稅負制之施行對境內股東稅後之實質所得並無影響。惟我國外資股東並不適用兩稅合一制，故當公司增加繳納最低稅負額時，外資股東可獲配之股利所得亦隨之下降。因此，本文推論外資股東會在最低稅負制實施後出售其股權予境內股東，以減少最低稅負制對其租稅負擔之衝擊，故本文提出以下假說：

**H2：其他條件相同下，2006 年施行最低稅負制後，上市櫃公司加徵之最低稅負額愈高者，其外資持股比率愈低。**

## 2.3 調降營利事業所得稅率與外資股權比率變動之假說

在兩稅獨立課稅制國家調降營利事業所得稅率會使境內股東及外資股東租稅負擔均減少，然而在兩稅合一稅制下，調降營利事業所得稅率之主要租稅受益者為外資股東，境內股東稅後之股利所得不因調降營利事業所得稅率而改變。因此，本文推論，在 2010 年調降營利事業所得稅率後，有效稅率下降之公司，其外資持股比率會增加，故提出假說如下：

**H3：其他條件相同下，2010 年調降營利事業所得稅率後，上市櫃公司有效稅率下降者，其外資持股比例愈高。**

## 3. 研究方法

本文以我國 1994 年至 2012 年之非金融業上市櫃公司為研究對象，觀察兩稅合一制之實施及兩稅合一制下之租稅變革對我國上市櫃公司股權結構之影響，由於本文之研究期間共計 19 年，故資料型態兼具時間序列及橫斷面之性質，若以普通最小平方法作為研究方法恐使估計結果產生偏誤，因此，本文以追蹤資料模式為研究方法，除了可控制無法觀察之個別公司的特性差異外，並能有效補足時間序列及橫斷面模式中無法單獨檢定之效果。

## 4. 研究結果

本文的實證結果顯示，兩稅合一制實施後，上市櫃公司稅額扣抵比率愈高者，其外資持股比率下降愈多，符合租稅顧客效果假說。此外，兩稅合一制下施行最低稅負制後，加徵最低稅負之上市櫃公司，其外資股東之持股比率減少與最低稅負加徵之稅額有顯著之正向關係。最後，兩稅合一制下調降營利事業所得稅率後，有效稅率降低之上市櫃公司，其外資股東之持股比率則顯著增加。這些實證結果支持我國資本市場之股權結構演變符合租稅顧客效果之假說。

此外，本文另進行六項額外測試及分析，分別為：(1) 變更各項稅制變革之研究期間；(2) 排除研究期間外資持股比率皆為零之樣本；(3) 將外資股東區分為外資個人股東及外資機構股東，以觀察各項稅制變革對外資個人股東及外資機構股東之影響；(4) 將外資之機構投資人區分為積極投資人 (active investor) 及非積極投資人 (less active investor) 等兩組，以觀察各項稅制變革對不同積極程度之股東的影響；(5) 考量企業股利發放機率之影響；(6) 以時間序列之方式分析外資持股比率之趨勢。額外分析之研究結果發現，整體而言，本文之實證結果並不受到變更研究期間、排除研究期間外資持股比率皆為零之樣本及企業股利發放機率之影響。其次，本文發現外資機構投資人對於稅制變革之反應較外資個人投資人明顯，顯示外資機構投資人係屬於較精明之投資者，因此因應我國稅制變革而調整其持股比率之狀況較為顯著。此外，當進一步將外資機構投資人區分為積極投資人及非積極投資人等兩組後，本文發現積極之外資機構對因應稅制變革之反應亦較非積極之外資機構投資人明顯。最後，本文亦於外資持股比率之時間序列趨勢分析圖發現，實施兩稅合一制之年度，外資持股比率呈現下跌之趨勢，且調降營利事業所得稅率之年度，外資持股比率呈上揚之趨勢，符合本文之預期。

過去關於兩稅合一之研究多數著墨於探討兩稅合一制之施行對公司籌資及股利政策之影響，少有文獻以租稅變革之角度探討兩稅合一制下所實施之加稅及減稅政策對資本市場外資股權之影響。因此，本文的研究發現除延伸國外在兩稅獨立課徵下租稅顧客效果之研究，提供股東租稅顧客效果於兩稅合一稅制下之實證證據外，亦補充過去關於兩稅合一制相關文獻之不足。此外，由於外資持股比率係政府用以觀察國家經濟發展及投資環境條件之重要參考指標，因此瞭解影響外資持股比率之因素有其研究之重要性，惟過去關於研究外資持股比率之文獻多係探討公司經營狀況及公司治理優劣對外資持股比率之影響，較少有文獻納入租稅考量，探討稅制變革對外資持股比率之影響，因此，本文之實證結果亦可補充過去文獻的不足，提供

租稅政策亦是影響外資持股比率之重要因素的實證證據。最後，本文之研究結果亦有助於了解兩稅合一制下公司稅制租稅變革的實質稅負影響效果，可作為政府未來制定稅制時之參考。