

出國報告（出國類別：國際會議）

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服務機關：國立高雄應用科技大學 財富與稅務管理系

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派赴國家：日本

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摘要：

本次出國目的在參加 2016 年暑期 ISESS 國際研討會 (2016 International Symposium on Economics and Social Science—Summer Session)。2016 年暑期 ISESS 國際研討會由日本的千葉工業大學 (Chiba Institute of Technology)、關西學院大學 (Kwansei Gakuin University)，以及台灣的實踐大學、淡江大學聯合主辦，京都市政府協辦，在日本京都的京都市國際交流會館 (Kyoto International Community House (Kyoto City International Foundation)) 舉行，會議時間從 2016 年 7 月 12 日至 14 日，總計 3 天。

報告撰寫人於本次研討會口頭發表一篇論文，於 7 月 12 日開幕當天下午第 3 場次進行，題目是 *The Impacts of Fiscal Policies on Economic Growth: An Application of the Autoregressive Distributed Lag (ARDL) Model*。論文主要利用台灣 1955 至 2014 年的時間序列資料，以自我迴歸分配落後模型 (Autoregressive Distributed Lag Model, ARDL) 估計我國在樣本期間公共投資、有效稅率、直接稅占間接稅之租稅結構變數及經濟成長率的長期關係。相較於傳統的共整合方法，ARDL 實證方法的優點如下：首先、可同時處理整合階次不同的時間序列變數；二、只須估計單一方程式，估計結果簡單、容易解釋；三、允許模型中不同變數有不同的落後期數。實證結果發現此四變數

有長期共整合關係，且在樣本期間內，我國的經濟成長率主要是受租稅結構因素影響。維持相同的租稅負擔及公共投資水準下，提高間接稅占直接稅比率將有助於經濟成長。日前我國政府提出提高營業稅以作為政府推動長期照護的財源。從本研究的分析結果來看，此一租稅政策對經濟成長應不致於產生負面影響。

出席此次國際研討會的最大收獲在於和其它國家的學者討論最新的時間序列實證方法，並分享實證分析過程和解釋估計結果的心得。其次，也和日本學者探討目前日本政府急欲刺激景氣的各項經濟政策和租稅政策對日本總體經濟的影響。

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1、 目的

本次出國目的在參加 2016 年暑期 ISESS 國際研討會 (2016 International Symposium on Economics and Social Science—Summer Session)。2016 年暑期 ISESS 國際研討會由日本的千葉工業大學 (Chiba Institute of Technology)、關西學院大學 (Kwansei Gakuin University)，以及台灣的實踐大學、淡江大學聯合主辦，京都市政府協辦，在日本京都的京都市國際交流會館 (Kyoto International Community House (Kyoto City International Foundation)) 舉行，會議時間從 2016 年 7 月 12 日至 14 日，總計 3 天。

本次研討會是聯合年會，同時舉行的研討會還包括 2016 International Conference on Library and Information Science (LIS2016)、2016 International Conference on Engineering and Natural Science—Summer Session 和 2016 International Conference on Hospitality, Leisure, Sports, and Tourism—Summer Session。由於是聯合年會，因此來自世界各國及日本當地的學者相當多，收錄的論文數百篇，充分達到國際學術交流的目的。報告撰寫人所發表的論文屬於經濟學類，本次研討會經濟學類論文主題涵蓋廣泛，包括教育經濟學、經濟成長、國際貿易、公共經濟學、財務金融及貨幣經濟學等，而每個核心主題

下又包含有數個子題。論文所探討的研究對象，除報告撰寫人分析台灣的議題外，各國學者也分別分析該國的特殊現象，包括日本、香港、泰國、歐盟和伊斯蘭國家等。

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2、 過程

報告撰寫人的行程為台灣時間 7 月 11 日上午由高雄出發，搭乘台灣高鐵至高鐵桃園站，轉接駁至桃園國際機場。搭乘復興航空 GE604 班機出境，於日本當地時間晚上 8 點抵達大阪的關西國際機場，隨即安排機場附近旅店住宿。次日 (7 月 12 日) 早上搭乘交通運輸工具抵達京都市國際交流會館完成註冊與報到，並領取大會議程及論文摘要集等會議資料，隨即進行 3 天的議程。14 日會議結束後，由於暑假班機因素，報告撰寫人搭乘 7 月 18 日下午的復興航空 GE601 班機回桃園機場，返抵國門。

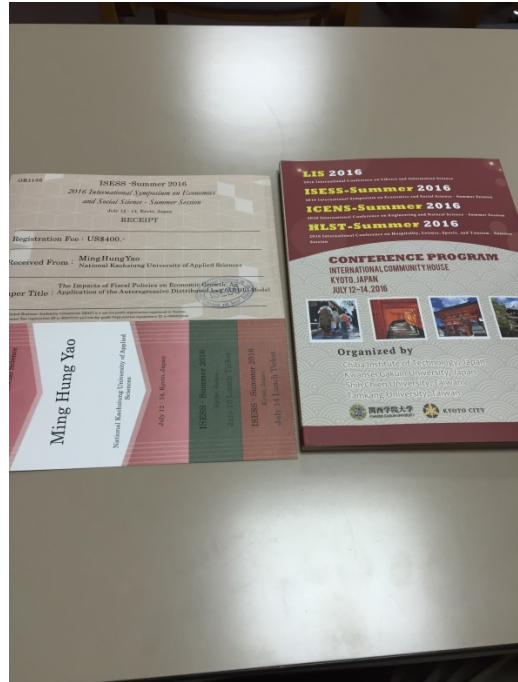
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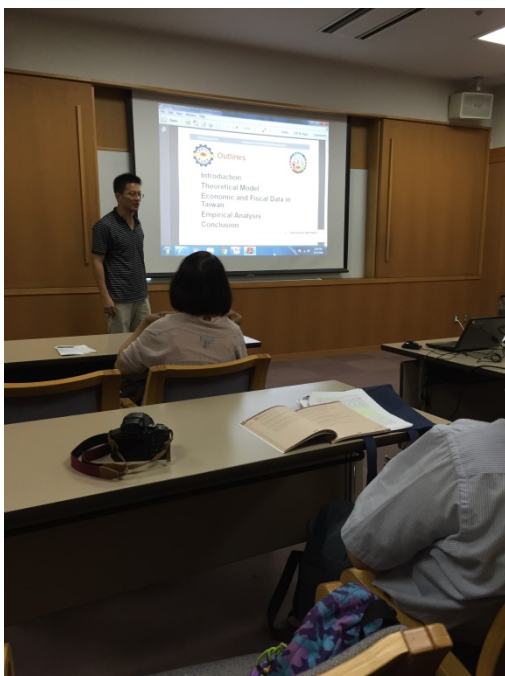
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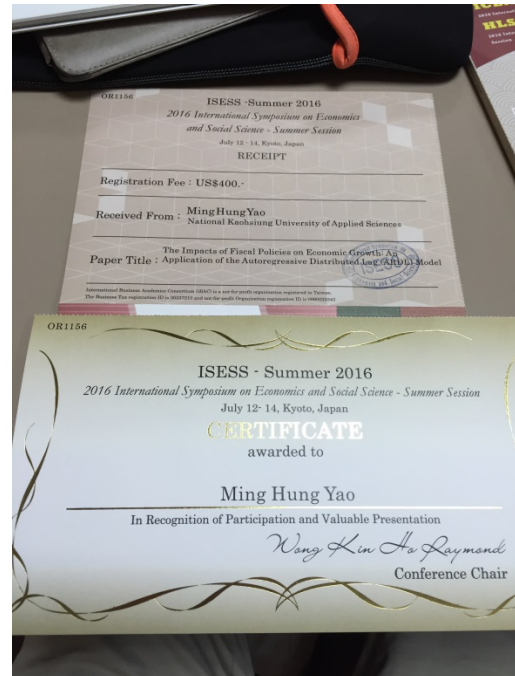
研討會會場



註冊資料及會議手冊



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出席證書

報告撰寫人所發表之論文：

The Impacts of Fiscal Policies on Economic Growth: An Application of the Autoregressive Distributed Lag (ARDL) Model

Ming-Hung Yao**

Abstract

This paper considers both public investment and taxation to analyze the impact of fiscal policy on economic growth in the period of 1955-2014 in Taiwan. The autoregressive distributed lag (ARDL) approach is used to deal with the series of different orders of integration. The results indicate that there is a long-run equilibrium relationship among public investment-to-GDP ratio, tax mix, defined as the ratio of direct to indirect taxes, the average tax rate or tax burden, and Taiwan's economic growth rate. Tax mix has significantly negative effects on economic growth. The public investment and average tax rate have no significant effect on economic growth. This may arise from three reasons. First, the link between public investment and growth has weakened over time. Second, the effects of direct and indirect taxation on economic growth cancel each other out. Third, the tax cut money spent on the personal consumption instead of private investment leads to a negligible effect of taxation on long-term economic growth. Our results do not coincide with Harberger's superneutrality conjecture. Instead, they support the argument of endogenous growth theory that given same public investment-to-GDP ratio and tax burden, reducing the ratio of direct to indirect taxes enhances economic growth.

Keywords: economic growth, public investment, tax burden, tax mix, ARDL model
JEL Classification: O11, R53, H20

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economic growth. This paper aims to examine the short-run dynamics and long-run relationship among Taiwan's economic growth and other fiscal policy variables by using the autoregressive distributed lag (ARDL) approach. This approach was proposed by Pesaran et al. (2001). The advantage of employing this approach to cointegration is that a null hypothesis of no cointegration can be tested when variables have different orders of integration. We apply this methodology to Taiwanese data during 1955-2014 since the ADF and PP unit root tests show that Taiwan's public investment to GDP ratio, tax burden, and tax mix, defined as the ratio of direct to indirect taxation, are all I(1) series and its economic growth rate is an I(0) series. Our estimation results show that a long run relationship exists among these variables.

Our results indicate that tax mix has significantly negative effects on economic growth. The public investment and average tax rate or tax burden have no significant effect on economic growth. This may arise from three reasons. First, the link between public investment and growth has weakened over time. Second, the effects of direct and indirect taxation on economic growth cancel each other out. Third, the tax cut money spent on personal consumption instead of private investment leads to a negligible effect of taxation on long-term economic growth.

This paper is organized as follows. Section 2 provides a brief literature review. Section 3 introduces the theoretical model. Section 4 describes Taiwan's economic and fiscal data. Section 5 presents an empirical analysis and section 6 concludes.

2. Literature Review

Numerous studies have discussed the relationship between public investment and economic growth. Aschauer (1989) indicates that nonmilitary public capital stock has substantial influence on economic growth. Insufficient public investment accounted for the slow U.S. economic growth during the 1970s and 1980s. Kocherlakota and Yi

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1. Introduction

In the midst of the 2008 global economic recession, Taiwanese government proposed tax cuts in motor vehicle excise tax, corporate income and personal income taxes. It also laid out twelve public construction projects, including island-wide transportation network, flood control and river rectification, sewer construction, and etc. These discretionary policies regain attention in the long-term effect of taxation and public investment on economic growth. Whether these expansionary policies are able to revive Taiwan's economy is the question we would like to investigate in this paper.

The effects of fiscal policies on economic growth have been widely discussed in the literature. Endogenous growth theory states that sustained economic growth can be explained by increasing returns to scale, human capital, research and development, and public investment (Romer, 1986; Lucas, 1988). Public investment aims to accumulate public capital, such as roads, airports, railways, ports, water system, electricity and etc. Provision of public infrastructure reduces private production cost, enhances production efficiency, and encourages private investment. Underinvestment in infrastructure may retard economic activities, and pose risks to a nation's productivity and standard of living.

Tax revenue is the main source to finance government expenditure. Taxes reallocate resources and affect capital formation. Endogenous growth economists state that public investment directly affects a country's long-term production capacity through public capital accumulation. Taxes alter the returns of production factors and indirectly affect market activities. When it comes to economic growth, both taxation and public investment are important elements.

Unlike previous research, which uses solely taxes or public investment in estimation, this paper considers both to analyze the impact of fiscal policies on

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(1996) further propose that a 1 percent increase in the ratio of nonmilitary equipment capital to GNP will permanently raise GNP per capita by 2 percent. Frutos et al. (1998) show when public capital stock increases by 1 percentage point, equilibrium output level in Spain will grow by 2.8 percentage points. However, Cheung et al. (2012) suggest that the link between public investment and growth has weakened over time. According to their cross-sectional and time-series regressions, public investment in high-income countries is more likely to have a negative effect on economic growth. Ramos and Roca-Sagales (2008) use a vector autoregression approach to estimate the effect of fiscal policies on GDP. They find an increase in public spending has a negative impact on long-term output growth. Mo (2007) decomposes the effect of government expenditures on real GDP growth rates. He concludes that 1 percentage point increase in the share of government investment expenditure raises the equilibrium GDP growth rate by 0.167 percentage points. Yet, government consumption expenditures have negative marginal effects on economic growth.

The impact of tax policies on economic growth remains unresolved (Myles, 2000). Superneutrality conjecture proposed by Harberger (1964) argues that tax policies have limited impact on labor supply, private savings, investment and economic growth. Kocherlakota and Yi (1996, 1997) present that the highest and effective personal income tax rates have no significant effects on U.S. and U.K. long-term economic development. Mendoza et al. (1997) estimate the effective tax rates of consumption tax, labor income tax, and capital income tax for 18 OECD countries. Their results indicate that these effective tax rates have small and insignificant impact on the average growth rate of GDP per capita.

Other empirical studies provide evidences that tax policies may affect economic growth. Auerbach and Kotlikoff (1987) evaluate fiscal policies with a dynamic simulation model and find that consumption tax tends to encourage savings and

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capital formation. Skinner (1987) estimates data of 31 African countries during 1965-1982 and concludes that given the same tax revenue, increased consumption tax rates associated with decreased import duty, personal income, and corporate income tax rates help boost economic growth. Wang and Yip (1992) find that the consumption tax has a positive effect but income tax has a negative effect on economic growth. The opposing effects of these two taxes result in an insignificant impact on output. They suggest that individual rather than aggregate tax rates should be used to examine the effect of taxation on economic growth. Branson and Lovell (2001) estimate the combination of tax burden and tax mix that maximizes New Zealand's economic growth rates. Their results show that during the sample period, the actual tax burden and tax mix exceed the growth-maximizing levels. If the government reduces the tax burden, real GDP will increase and people will obtain more purchasing power.

3. Theoretical Model

Suppose a representative agent maximizes his utility defined as equation (1).

$$U(C_t) = E_0 \sum_{t=1}^{\infty} \rho^t \ln(C_t) \quad (1)$$

where C_t denotes the consumption level at time t , ρ is the discount factor. The production function is assumed as equation (2).

$$Y_t = (A_t D_t) K_t^\alpha G_t^\beta \quad (2)$$

where Y_t is the output level, A_t represents the technology shock, D_t is the ratio of direct to indirect tax, K_t is the private capital stock, and G_t is the public capital stock at time t . Equation (2) implies that tax policies affect not only the accumulation of private capital through the changes of tax burden, but the output level with varying ratios of direct to indirect tax. Equation (3) defines the law of motion for private capital accumulation.

$$K_t = K_t - K_{t-1} = BK_{t-1} \left(\frac{I_{t-1}}{K_{t-1}} \right)^\delta \quad (3)$$

where δ represents the rate of depreciation and $0 < \delta < 1$. I_{t-1} is the private investment at time $t-1$. Assume τ_t is the effective tax rate. After-tax output level will be allocated between consumption and investment. The relationship between consumption, investment and output level can be expressed as

$$C_t + I_t = (1 - \tau_t) Y_t \quad (4)$$

The representative agent maximizes his utility with respect to equations (2), (3) and (4). Consumption and investment can be obtained as¹

$$C_t = (1 - S)(1 - \tau_t) Y_t \quad (5)$$

and

$$I_t = S(1 - \tau_t) Y_t \quad (6)$$

where $S = \alpha\rho\delta/[1 - \rho(1 - \delta)]$.

Referring to Koehlerlakota and Yi (1997), the growth rate of output level can be expressed in structural form as²

$$\Delta y_t = \ln Y_t - \ln Y_{t-1} = F(G_t, \tau_t, D_t) \quad (7)$$

4. Economic and Fiscal Data in Taiwan

During the sample period (1955-2014), the unweighted average Taiwan economic growth rate was 7.62% (Figure 1). Except for the periods of technology bubble burst in 2001 and financial crisis between 2008 and 2009, Taiwan has had positive economic growth rates. Taiwan economic growth rates gradually declined from 10.86% in the 1970s, 8.48% in the 1980s, 6.63% in the 1990s, to 3.81% in the 2000s. Nevertheless, real GDP per capita by using 2011 as the base year increased from \$1,194 in 1960 to \$22,600 in 2014. Taiwan has turned into an advanced

¹ See Appendix 1 in Koehlerlakota and Yi (1997) for details.

² See Appendix 2 in Koehlerlakota and Yi (1997) for details.

economy according to the IMF World Economic Outlook, September 2011.

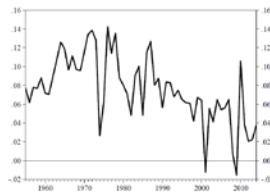


Figure 1 Taiwan economic growth rate, 1955-2014

In this paper, public investment is defined as the gross fixed capital formation of government sector. Figure 2 shows the public investment-GDP ratios between 1955 and 2014. During the oil crisis in the 1970s, Taiwan government expanded the construction of ironworks and shipyards. The unweighted average ratio of public investment to GDP is 4.07% in 1970s, and 4.41 in 1980s. In the late 1980s and early 1990s, Taiwan government started the transport infrastructure investment projects. However, the ratio has continuously dropped since then due to the substantial budget deficits.



Figure 2 Ratio of public investment to GDP, 1955-2014

Figure 3 represents the ratios of tax burden between 1955 and 2014. The tax burden during this period was between 11.4% and 18.9%. In 2003, the ratio dropped to its lowest level around 11.4%. Figure 4 shows the ratios of tax mix between 1955 and 2014. The ratio has constantly risen except for several years in the early 1990s and 2000s. Taiwan's economy soared in the 1970s, which increased personal income and broadened the tax base. Income taxes hence became the main source of tax revenue. Since the 1980s Taiwan has reduced its tariff barriers to promote trade with the U.S. The share of customs duties in total tax revenue gradually declined. Taiwan stock market has developed rapidly since 1988. Before the Asian financial crisis in 1997, the share of securities transaction taxes in total tax revenue increased and slightly increased the ratio of direct to indirect taxes. In general, before 1989, the tax mix was less than one, implying that indirect taxes accounted for a larger share of total tax revenue. After 1989, direct tax revenue gradually exceeded indirect tax revenue. In 2014, the tax mix was 1.48. Direct taxes contributed about 60% to total tax revenue.

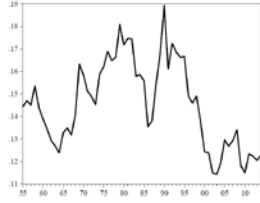


Figure 3 Tax burden (ratio of tax revenue to GDP), 1955-2014

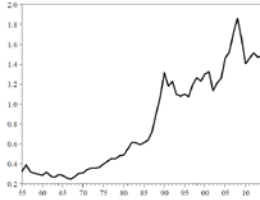


Figure 4 Tax mix (ratio of direct to indirect taxes), 1955-2014

5. Empirical Analysis

We follow Bal and Rath (2014) and Morley (2006) by applying an ARDL model to Taiwanese annual data from 1955 to 2014. The data of all empirical variables are obtained from the AREMOS database. $GDPGR$, $PUBINV$, TB and TX denote the GDP growth rate, the public investment-to-GDP ratio, tax burden, and tax mix, respectively. Table 1 summarizes the descriptive statistics of these variables. Table 2 shows correlation coefficients of variables: the GDP growth rate is negatively correlated to

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public investment and tax mix, and positively correlated to tax burden.

Table 1 Descriptive statistics

	Mean	Maximum	Minimum	Std. Dev.	Observations
$GDPGR$	4.975	6.496	3.158	1.084	60
$PUBINV$	0.042	0.078	0.020	0.015	60
TB	0.146	0.189	0.114	0.020	60
TX	0.812	1.862	0.245	0.493	60

Note: The sample period is from 1955 to 2014.

Table 2 Correlation coefficients of variables

	$GDPGR$	$PUBINV$	TB	TX
$GDPGR$	1.000	-	-	-
$PUBINV$	-0.205	1.000	-	-
TB	0.269	0.440	1.000	-
TX	-0.652	0.496	-0.326	1.000

A complete ARDL approach to cointegration involves four steps. First, identify the order of integration of each variable. Second, select the lag order of the ARDL model and compute the Wald statistics to see whether a long run relationship exists among variables. Third, estimate the long run coefficient. Fourth, estimate the short-run dynamics parameters. We apply two commonly used unit root tests: the augmented Dickey and Fuller (1979, 1981; ADF) and Phillips and Perron (1988; PP) to verify the stationarity of each time series. Table 3 shows that GDP growth rate is a $I(0)$ series and the public investment-to-GDP ratio, tax burden, and tax mix are all $I(1)$ series at the 5% significance level.

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Table 3 Results of unit root test

Variable	ADF		PP	
	level	first differenced	level	first differenced
$GDPGR$	-5.277[1]***	-	-5.920[1]***	-
$PUBINV$	-1.484[1]	-4.355[0]***	-1.024[3]	-4.374[3]***
TB	-2.022[0]	-7.913[0]***	-2.020[2]	-7.913[0]***
TX	-3.293[1]**	-6.257[0]***	-2.669[1]	-6.227[3]***

Notes: The numbers in parentheses indicate the selected lag order. The regressions include an intercept and trend. The superscript *, **, and *** indicates significance at the 10%, 5% and 1% level. The null hypothesis for both tests that a variable has a unit root.

In the second step, we estimate equation (8) to test the null hypothesis: $\delta_1 = \delta_2 = \delta_3 = \delta_4 = 0$ against the null hypothesis: $\delta_1, \delta_2, \delta_3, \delta_4 \neq 0$. According to the interpretation of lower bound and upper bound critical values stated in Pesaran et al. (2001), a computed F -statistic less than the lower bound value fails to reject the hypothesis. A computed F -statistic exceeding the upper bound value indicates that a long-run relationship exists between variables. No conclusions can be drawn if a computed F -statistic is between the lower and upper bound values. Based on the AIC and SC criteria, the optimal lag orders for $GDPGR$, $PUBINV$, TB , and TX are all one. The results in Table 4 show that the calculated F -statistic in our ARDL (1, 1, 1, 1) model is greater than the critical value at the 5% significance level. Hence, we conclude there exists a long-run relationship between economic growth and fiscal policy variables.

$$\begin{aligned} \Delta GDPGR_t = & \eta + \delta_1 \cdot GDPGR_{t-1} + \delta_2 \cdot PUBINV_{t-1} + \delta_3 \cdot TB_{t-1} + \delta_4 \cdot TX_{t-1} \\ & + \sum_{i=0}^{\alpha_1} \alpha_i^{GDPGR} \cdot \Delta GDPGR_{t-i} + \sum_{i=0}^{\alpha_2} \alpha_i^{PUBINV} \cdot \Delta PUBINV_{t-i} \\ & + \sum_{i=0}^{\alpha_3} \alpha_i^{TB} \cdot \Delta TB_{t-i} + \sum_{i=0}^{\alpha_4} \alpha_i^{TX} \cdot \Delta TX_{t-i} + \varepsilon_t \end{aligned} \quad (8)$$

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Table 4 Bound F -test results

F -statistic value	Lag length	5% bound critical values	
		$I(0)$	$I(1)$
7.668	$q_1 - q_2 - q_3 - q_4 - 1$	3.23	4.35

Note: Critical values are cited from Pesaran et al. (2001)

In the third step, we proceed to estimate the long-run coefficients estimation from equation (9). The results in Table 5 indicate that tax mix has a significantly negative impact on Taiwan's economic growth. It implies that higher ratio of direct to indirect taxation reduces Taiwan's economic growth in the long run. The public investment and average tax rate has no significant effect on economic growth. This may arise from three reasons. First, the link between public investment and growth has weakened over time. According to Cheung et al. (2012), public investment in high-developed economies is more likely to have a negative effect on economic growth. Second, the effects of direct and indirect taxation on economic growth cancel each other out. Third, the tax cut money spent on the personal consumption instead of private investment leads to a negligible effect of taxation on long-term economic growth.

$$\begin{aligned} GDPGR_t = & \theta + \sum_{i=0}^{\beta_1} \beta_i^{GDPGR} \cdot GDPGR_{t-i} + \sum_{i=0}^{\beta_2} \beta_i^{PUBINV} \cdot PUBINV_{t-i} \\ & + \sum_{i=0}^{\beta_3} \beta_i^{TB} \cdot TB_{t-i} + \sum_{i=0}^{\beta_4} \beta_i^{TX} \cdot TX_{t-i} + \varepsilon_t \end{aligned} \quad (9)$$

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Table 5 Estimation of long run effect

Variable	Coefficient	t-test statistics
<i>GDPGR</i>	0.084	0.618
<i>PUBINV</i>	0.439	1.068
<i>TB</i>	-0.065	-0.221
<i>TX</i>	-0.052***	-3.592
<i>CONSTANT</i>	0.102**	2.429
Adjusted R-squared	0.408	
F-statistic	11.011	
Prob(F-statistic)	0.000	
Akaike info. criterion	-4.257	
Schwarz criterion	-4.081	
Durbin-Watson stat.	1.913	

Note: The superscript ** and *** indicates significance at the 5% and 1% level.

We also apply the cumulative sum of recursive residuals (CUSUM) and the CUSUM of square (CUSUMSQ) tests to check the stability of the regression coefficients. In figures 5 and 6, the plots of CUSUM and CUSUMSQ stay within the 5% critical bounds, suggesting the stability of the parameters and the overall model. A LM test is used for examining the serial correlation of the residuals. Table 6 indicates that the null hypothesis of no serial correlation cannot be rejected at the 5% significance level.

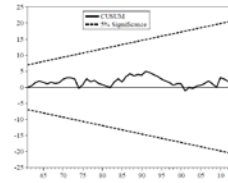
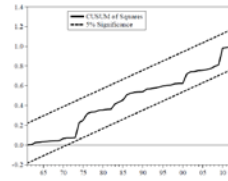


Figure 5 CUSUM test



Figures 6 CUSUM SQ test

Table 6 Residual autocorrelation test

Model	LM(1)	LM(2)	LM(4)	LM(8)
<i>ARDL</i> (1, 1, 1, 1)	1.125[0.289]	1.847[0.397]	3.237[0.519]	5.618[0.690]

Note: Numbers in brackets represent p-values.

In the final step, we estimate an error correction model (ECM) in equation (3) to examine the short-run dynamics of variables.

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$$\begin{aligned} \Delta GDPGR_t = & \mu + \theta \cdot ECT_{t-1} + \sum_{i=1}^{q_1} \gamma_i^{GDPGR} \cdot \Delta GDPGR_{t-i} \\ & + \sum_{i=1}^{q_2} \gamma_i^{PUBINV} \cdot \Delta PUBINV_{t-i} + \sum_{i=1}^{q_3} \gamma_i^{TB} \cdot \Delta TB_{t-i} \\ & + \sum_{i=1}^{q_4} \gamma_i^{TX} \cdot \Delta TX_{t-i} + \varepsilon_t \end{aligned} \quad (10)$$

where ECT_{t-1} represents the lagged error correction term from the cointegration model. Table 7 presents the results. A stable long-run relationship among the variables is verified since the error correction term with a value of -0.894 is significant (Banerjee et al. 1998). A significantly negative lagged error correction term implies that the dependent variable $\Delta GDPGR$ will converge to its long-run equilibrium level, suggesting that deviations from equilibrium are corrected at about 89.4% annually. In our model, a significant error correction term running from fiscal policy variables to the growth rate of GDP is indicative of long-run causality. Moreover, the lagged differenced terms of public investment-to-GDP ratio are significant, providing evidence of short-run causality.

Table 7 Results of error correction representation

Variable	Coefficients	t-test statistics
ECT_{t-1}	-0.894***	-6.725
$\Delta PUBINV_{t-1}$	2.515***	2.803
ΔTB_{t-1}	-0.522	-1.169
ΔTX_{t-1}	-0.067	-1.439
Adjusted R-squared	0.475	
F-statistic	13.872	
Prob(F-statistic)	0.000	
Akaike info. criterion	-4.343	
Schwarz criterion	-4.166	
Durbin-Watson stat.	1.969	

Note: Dependent variable $\Delta GDPGR$. The superscript *** indicates significance at the 1% level.

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6. Conclusion

This paper discusses the effects of fiscal policies on Taiwan's economic growth. Both taxes and public investment are considered as explanatory variables in the cointegration analysis. Tax mix has significantly negative effects on long-run economic growth. The average tax rates have no significant effect on economic growth. The short-run dynamics indicate significant interactions between public investment and economic growth. Our results do not coincide with Harberger's superneutrality conjecture. Instead, they support the argument of endogenous growth theory that given same public investment-to-GDP ratio and tax burden, reducing the ratio of direct to indirect taxation enhances economic growth.

Our results implicate that the effect of public investment on Taiwan's economic growth may be limited due to its crowding-out effect on private investment. Besides, cutting taxes may not be useful to Taiwan economy when the tax cut money is not allocated away from personal consumption to private investment. In order to promote long-term economic growth, the government should focus on adjusting tax structures, such as lowering the ratio of direct to indirect taxation.

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3、 心得及建議

本次研討會報告撰寫人發表一篇論文，國內外學者對本篇論文所探討我國租稅結構的議題感到相當有興趣，論文發表後也向本人提出有關台灣目前租稅政策以及論文研究方法的相關問題。與國內外學者交換研究意見，對報告撰寫人後續研究規劃及研究方向獲益良多，最重要的是可瞭解目前國際上時間序列研究方法、租稅政策及其它總體經濟政策的最新知識。報告撰寫人可以與各國各領域的時間序列研究人員進行討論與廣泛交換意見，獲益良多，參加國際性研討會有助於提高學術視野，因此期望國內專家學者能多加前往參會，以便提高國內時間序列研究在國際上之知名度，對於個人之研究可吸收最新研究方法，將有極豐富的啟發及研究助益。此外，經由與國外學者的意見交流，可得知國外總體經濟政策的影響。雖然由國際性的財經媒體可得知這些政策措施，但從學者的研究才能發現這些政策的影響。

國際學術交流對於相關領域的從業人員是必要的活動，其中，又以國際型學術研討會最為重要。因為國際性研討會提供一個平台，讓學術人員及業界人士，充分交流。本次參與 2016 年暑期 ISESS 國際研討會，成果豐碩，除與國內外與會之專家學者交換研究心得外，也吸取很多寶貴經驗與想法，建議國內之專家學者多能在參與多國舉辦

之國際研討會後，貢獻經驗提供國內的國際研討會籌備參考。有感於研究不能閉門造車，應多與各國之研究學者專家交流，才能以獲裨益，使國內有志從事時間序列及租稅政策研究之年輕後輩，除學校課程與參加研討會外，能進一步在研討會中學習理論基礎及實務之機會。