Low Responsiveness of Income Tax Functions to Sectoral Output: An Answer to Declining Tax Ratio in Sri Lanka?

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Abstract

Tax revenue of Sri Lanka has not increased in par with its economic growth, infact, tax revenue as a percent of GDP (tax ratio) has declined overtime. Many admit tax exemptions, tax holidays, tax avoidance and tax evasion, weaknesses and corruption at the level of tax collection, accounting difficulties of actual income, etc. are as main reasons for the declining tax ratio. However, one would also wonder whether changes in the structure of the economy may have some impact on tax revenue. Over the last six decades the economy of Sri Lanka has transformed from an agricultural economy to a service economywhich may affect the collection of tax revenue. This study estimates personal income and corporate income tax functions on agricultural, industrial and service sector output for the period 1974-2013 to find out the impact of sectoral output. It is found that agricultural output has no real impact on personal and corporate income tax collections. The study finds that the personal income tax is more responsive to service sector (0.57) than to the industrial sector (0.28). On the other hand, the corporate income tax is more responsive to industrial output (0.55) than to service sector output (0.29). This low responsiveness of income tax functions to service and industrial output and non-resiveness to agricultural output may result in declining tax ratio overtime.

Keywords:

Tax responsiveness, Tax buoyancy, Sectoral output, Dynamic and static models

1. Introduction

The presence of an efficient tax system is a must for economic development and wellbeing of people in any country. Any kind of tax affects the personal behaviours of tax payers directly as their after-tax income become low with taxes and consumers of public goods. Though a tax generates proceedings for the government to provide various public goods, benefits from those public goods provided out of tax proceedings will not be benefitial to all individuals to the same extent. A tax can be imposed to achieve various objectives, mainly to cover the costs of public goods, reduce income inequality, discourage certain production or consumption of the economy, protect domestic industries, manage demand side of the economy. Therefore, taxation remains as an important policy option for the government to direct and manage economic activity.

The objectives of the fiscal policy have been changed overtime in Sri Lanka. During the periods of closed and inward-looking economic policy periods, the main objective of the fiscal policy was to achieve price stability and financial manangement of the economy (Jayasundara, 1987). With the opening up of the economy and the dominance of the private sector economic behavior, the focus of the fiscal policy was changed to facilitate trade, commerce, investment and economic growth (Siriwardana, 1998; Jayawickrama, 2008a). Continuous and excessive debt financing of public expenditures have created an immense tax and debt burdens in the economy.

One of the important characteristics of the Sri Lanka's tax system is the dominance of indirect taxes in revenue generation. About 85-90 percent of tax revenue of the country is generated by taxing goods and services. Another issue of the country's tax system is the declining trend in the tax revenue with respect to the national income (Waidayasekara, 2001;Jayawickrama, 2008a, 2008b). In

1960s, the tax ratio was about 20 percent but it fell to about 14 percent recently. Until late 1970s, taxation on international trade was one of the main source of tax revenue of the country. The importance of taxes on international trade has declined as the government follows a liberal and free trade policies (Jayawickrama, 2008a).

This declining trend in tax ratio has created serious issues in the public finance of Sri Lanka. Given that the government expenditure remains high as 20 percent of GDP, the decline in government tax reveue exaggerated the budget deficits and raised the borrowing requirement making the the country more indebted. As the country experienced a moderate growth rate, about 5 percent on average, over the last three and half decades, the tax revenue ratio should also be expected to increase at least at a 3-4 percent growth rate. However, the declining trend in tax ratio implies that the tax revenue of the country has not increased in par with the economic growth. Many admit that tax exemptions, tax holidays, tax avoidance and tax evasion, weaknesses in the tax department, corruption at the level of tax collection, difficulties in accounting actual income, etc. are as main reasons for the declining tax ratio. However, one would also wonder whether changes in the structure of the economy may share some information of the declining tax ratio.

From 1950s to the present the economic structure of Sri Lanka has changed significantly. Six or seven decades ago, the country was highly dependent on its agricultural sector. But now the GDP of the country is mostly generated in service and industry sectors. Since the domestic agriculture is more a peasant sector, one may not expect a high contribution of that sector to tax revenue. But the expansion of service and industry sectors is expected to have high positive impact on tax revenue collection, especially corporate and personal income tax collection, as the growth of industry and service sectors enlarges the

coporate sector and raises the income of employees. However, the behavior of income tax revenue ratio does not indicate that the expansion of service and industry sectors has contributed largely to the generation of income for the government. Income elasticity of taxes is important in explaining the increase of tax revenue in relation to the expansion of tax base and it indicates the percentage change in tax revenue in response to an increase in the tax base by one percent. If the elasticity is less than unity it implies that tax revenue does not increase by the same amount of increase in the tax base. That type of tax fails to generate enough revenue for the government in the long run. As a result tax revenue as a percent of tax base decreases overtime.

There are many studies that focused on estimating income elasticity of aggregate tax revenue of Sri Lanka taking GDP as the tax base. However, no attempt was made to find elasticities using segregated tax base as agriculture, industry and services. This study focuses on short-term and long-term tax elasticities of income taxes of Sri Lanka in relation to changes in sectoral output and estimates personal income and corporate income tax functions on agricultural, industrial and service sector output. The output of these three sectors together represents the tax base, GDP. Since Sri Lanka's economic structure has changed markedly over the past 50-60 years, the study intends to find whether these changes affect the tax revenue of the government.

2. Literature Review

Income elasticity is used to explain the buoyancy of taxes in various countries. Tax buoyancy is an indicator to measure the efficiency and responsiveness of revenue mobilization in response to growth in the tax base, GDP or national income. A tax is said to be buoyant if the tax revenue increases more than proportionately in response to a rise in GDP. If the tax revenue shows less responsiveness to tax base, that type of tax fails to generate enough revenue

for the government in the long run. As Romer and Romer (2010) reveal, the structural changes in the tax system affect the economic activities. Jenkins et al. (2000) report that the examination of buoyancy of a particular tax is more important than that of a tax system.

Kargbo and Egwaikhide (2012) found that tax elasticity of Sierra Leone is about 0.891 during the period 1977-2009. This indicates that the tax revenue of the country does not grow at the same rate of expansion of the tax base. The reason for this is the high contribution of the agricultural sector in the economy. Ahmad and Mohamad (2010) identify low taxes imposed on the agricultural sector income as a reason for the declining tax revenue of developing countries.

Milwood (2010) finds that the tax system of Jamaica is inelastic to changes in the tax base. Tanzi and Zee (2001) find the uncertainity of agricultural income and informal sector income as a reason for low tax collection in developing countries. Ahmad (1994) finds that the expansion in the agricultural and service sectors is not very important in the determination of tax revenue. But the industrial growth reports a positive impact on tax revenue collection of developing countries over the years. He found the average tax buoyancy of 35 developing countries as 0.92 but that of Sri Lanka was about 0.80. Ahmed and Mohammed (2010) also report the insignificance of the agricultural sector in the determination of tax buoyancy in 25 countries. Using a panel data set of 105 countries, Gupta (2007) find that agricultural sector as an important determinant of tax revenue collection. Tanzi (1992) has found a negative relationship between the agricultural share of output and the tax revenue using panel data of 80 countries. This result has been confirmed by Chaudhry and Munir (2010) and they found a negative relationship between tax revenue and the expansion of the service sector.

Padda and Akram (2009) report that compared to India and Pakistan, the tax ratio of Sri Lanka tends to decline since 1990s. Siriwardana (1998) and Waidyasekara (2004) show that the tax system of Sri Lanka is inelastic. As a result the tax ratio declines over time. Premaratna (1989) shows personal income tax of Sri Lanka as higly inelastic. Reasons for this high income inelasticity may be tax avoidance and evasion. According to Jenkins and Hall (1993), the low performance of corporate income tax is due to weak performanence of the corporate sector because of insufficient investment on capital assets. Jayawickrama (2008a) identifies reduced taxes or elimination of taxes on international trade as one reason for the decling trend in the tax ratio. Premaratne (1985) reveals that tax system of Sri Lanka does not fit with different stages of development. Low tax buoyancy results in difficulties in generating more tax revenue with external shocks. Jayawickrama (2008b) reveal that the buoyancy of corporate income tax and goods and service taxes are low and that caused a decline trend in the average tax ratio. Jayasundara (1987) reports that Sri Lanka's tax system relatively have low responsiveness to changes in the tax base. Indraratne(2003) cites tax evasion, tax avoidance and tax incentives as major reasons for the low responsiveness of taxes to the national income.

3. Methodology

Tax Function

This study assumes that the tax functions take the following form:

$$tax_t = f(y_t, \tau_t, u_t) \quad \text{.....(1)}$$

in which tax revenue (tax_t) is assumed to be a function of tax base (Y_t), average of marginal tax rates (τ_t) and some unobserved factors (U_t)

In order to obtain income elasticity parameter, the following semi-log function is used in estimation:

$$\ln(tax_t) = \beta_0 + \beta_1 \ln(y_t) + \beta_2 \tau_t + u_t \quad \text{.....(2)}$$

The parameter β_1 in (2) can be easily interpreted as long-term income (tax-base) elasticity of tax revenue.

Income elasticity of tax is important in the determination of the buoyancy of a tax or a tax system. Tax buoyancy requires β_1 in (2) to be greater than one. This type of highly elastic tax function will generate more revenue for the government with faster economic growth. The presence of a buoyant tax system will ease the problems of public finance when the economy enters into rapid phases of economic growth. Many studies found that β_1 of the aggregate and disaggregate tax functions can be quite below unity (see Indraratne, 2003; Jayawickrama, 2008b).

Since the objective of this study is to examine the buoyancy of income tax functions of Sri Lanka with respect to changes in the composition of GDP, this study separates Y_t into Y_t^{agr}, Y_t^{ind} and Y_t^{ser} where three components of the GDP represent the sectoral output of agriculture, industry and services respectively.

With this modification (2) can be written as

$$\ln(tax_t) = \beta_0 + \beta_1^{agr} \ln(y_t^{agr}) + \beta_1^{ind} \ln(y_t^{ind}) + \beta_1^{ser} \ln(y_t^{ser}) + \beta_2 \tau_t + u_t \quad \text{.....(3)}$$

in which β_1^{agr}, β_1^{ind} and β_1^{ser} are sectoral-output elasticity of tax revenue. The aggregate income elasticity of tax in (2) is assumed to be linearly or non-linearly dependent on sectoral income elasticities in (3).

Estimation Method

Since equations (2) and (3) contain I(1) variables, the least squares parameter estimates in such regressions do not follow standard distributions unless the right-hand side variables are independent and the errors have no

autocorrelation. Therefore, standard t and F tests are generally inappropriate (see Sims, Stock and Watson, 1990; Enders, 2004:342) because right hand side variables in such regressions are generally dependent due to stochastic trend which results in serial correlation in the model. Although t and F statistics do not follow standard t and F distributions in static model involving non-stationary variables, they may follow relevant distributions in a dynamic model (Pesaran and Shin 1998). Thus, dynamic models, such as autoregressive distributed lag (ADL) model, generate long-term (cointegrating) solutions with standard t and F distributions. Long-term parameters derived from such dynamic models satisfy all the properties of standard regression models (Pesaran and Shin, 1998; Hendry and Doornik, 2001). In this study, we estimate the ADL model of (3) and derive the long-term parametrs of (3) using the parameters of the ADL model.

Sample and Data

Depending on the availability of data, sample period of regression models runs from 1973 to 2013. The 41 year sample period can be sufficient to generate stable long-term elasticities of the income tax functions.

4. Structural Changes in the Economy and tax functions

During the period from 1950 to the present, the structure of the Sri Lanka's economy has changed largely. As given in Table 1, the economy was predominantly agricultural contributing to 44 percent of GDP in 1950s. Prosperous plantation sector contributed largely to the dominance of the agricultural sector during the period. The contribution of the industrial sector was about 16 percent and service sector was about 40 percent. The services sector was also large as it provides many services required for the plantation industry and the export and import trade. The economy grew at an average rate of 3 percent during 1950-1959 period though most of economic growth generated in the service sector.

Table 1

Sectoral Composition of Output (% of GDP) and Economic Growth Rate

Sector	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2013
Agricultural Sector	43.58	36.16	28.97	27.24	23.64	13.85
Industrial Sector	16.30	17.23	26.08	27.02	26.36	29.33
Services Sector	40.12	46.61	44.95	45.74	50.00	56.82
Total	100.0	100.0	100.0	100.0	100.0	100.0
Economic growth rate (%)	3.10	4.68	3.91	4.26	5.22	5.71

Source: Based on Central Bank of Sri Lanka

From 1960 to 1969, the average economic growth rate increased to 4.7 percent. During the period, significant changes in the economy occurred in the agricultural and services sectors. The agricultural share of GDP decreased to 35 percent and services share increased to 48 percent while the share of industrial sector remained almost unchanged. The expansion of the public sector was the main reason for the service sector expansion.The public sector expansion occurred in production, distribution, supply of public goods, retail and wholesale trade and foreign trade (Jayawickrama, 2008).

The economy of Sri Lanka faced serious challenges and structural changes during 1970-79 period. From 1970 to 1977, the economy was highly a closed one. The government has given more emphasis on inward looking industrial policy in which many import substitution industries were started. Import substitution industries increased the industrial share of output markedly during the period, to about 27 percent of GDP, a 10 percentage points higher than the average of the previous decade. However, the performance of the import substitution industries was not long-lasting as they started to collapse with the removal of the protection given. The agricultural secor output continued to fall to about 29 percent of GDP and the service sector output also

decreased to 44 percent of GDP compared to 47 percent average of the previous year. The fall of output in the plantation sector and domestic agriculture due to drought caused further decline in agricultural output share. The average economic growth of the decade is about 4 percent but most of it came in the last few years of the decade with the introduction of free market policies. The manufacturing sector expanded rapidly during the late years of 1970s (Waiddyasekara, 2001).

The decline of the agricultural output share continued to be evident in the 1980s too but the pace of the decline was comparably low. Expansion of agricultural production under new irrigation development projects and revival of plantation agriculture resulted in a moderate growth of the agriculture output. Since the growth of other two sectors of the economy outweighed the agricultural growth, the agricultural share of output decreased but the pace of decline became slower. Since 1978, the government focused more on export promotion industries and large amount of investment was undertaken in export oriented industries. Though more attention was given to the industrial sector its output share did not improve. But the expansion of the service sector immediately after the liberalization of the economy was significant. The service sector output increased to 46 percent of GDP on average in 1980s. The expansion in services such as banking and financial mediation, trade and commerce, transportation, telecommunication and ICT sector, education, health, export business and services, etc. mainly contributed to the rapid rise in the service sector output.

Since 1990s the relative imporatnace of the service sector in the economy increased rapidly. The expansion of industrial sector instrumental services such as banking and financial services, wholesale and retail trade, propertity sales and insurance, services that facilitate export and import goods

and services, travel and tourism, hotels and restaurents, labour exports, etc. has contributed to the rapid expansion of the service economy. The service sector accounted for more than 50 percent of GDP of the country. The relative importance of the industrial sector also went up during 1990s to about 30 percent of GDP. The expansion of export industries, food processing, small and medium industry sector mainly created in the increase in industrial sector output. Though the real value of agriculture output reported a positive growth the agricultural share of GDP continued to decline and in 1990s it was around 23 percent on average. Though the completion of new irrigation projects, the expansion of the extent of cultivation and new subsidy programmes such as fertilizer subsidy increased the agricultural production, the higher growth rates reported in the services and industrial sectors resulted in further decline in the agricultural share of GDP.

During the period 2000-2013, the agricultural sector shrinked further by about 10 percentage points to 13 percent of GDP on average. By the year 2013, the agricultural share declined to 10.8 percent of GDP. While the industrial share of GDP remains unchanged, the decline in agricultural sector was replaced by the service sector expansion. The service sector accounted for more than 57 percent of the GDP on average during 2000-2013. The expansion of the supply of services such as banking and financial services, wholesale and retail trade, propertity sales and insurance, services that facilitate export and import goods and services, travel and tourism, hotels and restaurents, labour exports, military sector, etc. has contributed to the rapid expansion of the service economy.

In summary, the economy of Sri Lanka was transformed from an agricultural sector dominant economy in 1950s to service sector dominant economy in six decades. The industrial sector has reported a growth and expansion. However, the rate of growth of the industrial sector was not sufficient

to raise the industrial sector of Sri Lanka as a leading sector in the economy. The decline in agriculture, rapid expansion in services and sluggish growth in industries indicate significant changes in the structure of the economy.

Table 2

Tax revenue as a % of GDP

Sector	1960-1969	1970-1979	1980-1989	1990-1999	2000-2013
Total tax revenue as a % of GDP	21.51	19.01	19.34	19.12	13.83
Income tax as a % of GDP	4.03	3.11	3.05	2.78	2.53
Personal income tax as a % GDP	-	0.96*	0.89	0.98	0.61
Corporate income tax as a % GDP	-	2.07*	2.27	1.69	1.28

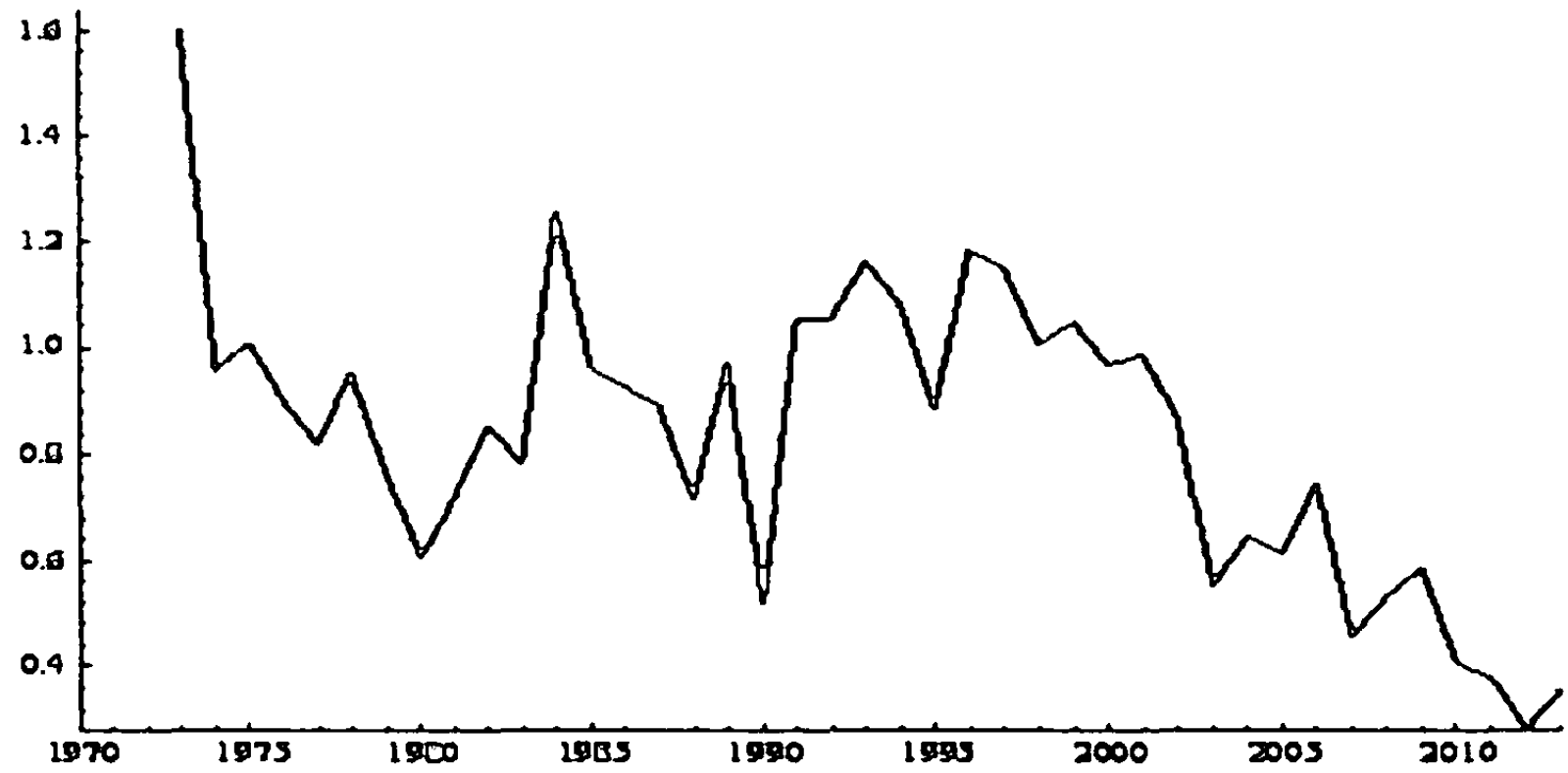
Source: Based on Central Bank of Sri Lanka

**1973-79. .*

Table 2 gives the composition of government revenue as a percent of GDP from 1960s to the present. Total tax revenue of Sri Lanka has declined from 21 percent in 1960-69 to 14 percent in 2000-13 period by seven percentage points. Of 21 percent of tax ratio, only 4 percent was generated from income taxes in 1960-69 period and this was reduced to 2.5 percent after 2000. The country's personal income tax collection is less than 1 percent of GDP and shows a decline over the years. During 1970-79 period, the corporate income tax revenue was about 2 percent of GDP and it went down to 1.2 percent by now. Figures 1 and 2 clearly depict this decline in personal income tax and corporate income tax ratios. Personal income tax ratio has declined rapidly after the year 2000 and the corporate income tax has experienced a deep decline between 2000 and 2005. The objective of this study is to build these declines in income tax functions on the structural changes in the GDP of the country.

Figure 1

Personal income tax revenue to GDP ratio (%)



Source: Based on Central Bank of Sri Lanka

Figure 2

Corporate income tax revenue to GDP ratio (%)

Source: Based on Central Bank of Sri Lanka

4. Results

Equation (3) is estimated using personal income tax revenue and corporate income tax revenue as dependent variables. The real values of income taxes and sectoral output are obtained deflating them by the GDP deflator. The tax rates used in the two tax functions are average personal income tax rate (personal income tax revenue/GDP) and the average corporate income tax rate (corporate income tax revenue/GDP). Lack of data on marginal tax rates compeled us to use average tax rates as approximates for average of marginal tax rates. The average marginal tax rate and the avarge tax rate are approximately the same if tax categories are proportional. Data constraints did not permit us examining the proportionality of tax categories but we follow Sahasakul (1980) who noted that tax categories can be approximately proportional. This approximation does not, however, seriously affect our objective of examining the sectoral income elasticity of tax functions.

Table 3

Regression Results: ADL(1,1) model of personal income tax

Dependant variable , ln(pit)

Variable	Coefficient	t value	Prob of t value
Constant	-3.755	1.04	0.305
ln[pit (t-1)]	0.114	-7.64	0.000
$\ln[y^{agri}(t)]$	0.017	0.12	0.902
$\ln[y^{agri}(t-1)]$	-0.049	-0.37	0.715
$\ln[y^{ind}(t)]$	0.095	0.81	0.426
$\ln[y^{ind}(t-1)]$	0.155	1.41	0.169
$\ln[y^{ser}(t)]$	0.592	9.36	0.000
$\ln[y^{ser}(t-1)]$	-0.083	-1.11	0.274
τpit(t)	1.285	26.4	0.000
τpit(t-1)	-0.056	-0.41	0.686
2012	-0.213	-4.37	0.000
R^2	0.995	ARCH 1-1 F test	0.098 [0.757]
DW	2.09	Normality Chi^2 test	2.962 [0.227]
n	40	Hetero F test	0.902 [0.597]
AR 1-2 F test	1.625 [0.216]	RESET F test	0.039 [0.844]

Tables 3 and 4 give the results of ADL estimation of personal income tax and corporate income tax functions. ADL model is a dynamic model and its dynamism depends on the lag length of the dependent and independt variables. The lag lengths of the estimated models are set to one by Akaike Information Criteria (AIC) and Schwarz Criteria(SC) model selection criteria. The estimated model was subject to tests on auto-correlation, auto-correlation conditional heteroscedasticity, normality of the error term, heteroscesdasticity and regression specification errors. Tables 5 and 6 give the long-term relationships of the relevant tax functions which derived from the ADL dynamic models.

Table 3 gives the dynamic model of the personal income tax function. We include a level dummy for 2012 to hold an unpredicted fall in the tax revenue in the year. The model explains the variation of the personal income tax revenuewell and it passes all the diagnostic tests indicating that the model satisfies all required conditions of a regression model. Table 6 gives the static long-run solution of the dynamic model. The error correction unit root test statistic (=-8.139) indicates that the static long-run solution is highly cointegrating and the the Wald test assures the high significance of the thelong-run solution.

Table 4

Solved Long-run Solution of the Personal Income Tax Function

Dep. var: ln(pit)

Variable	Coefficient	t value	Prob of t value
Constant	-4.236	-25.2	0.000
$\ln[y^{agri}(t)]$	-0.036	-0.42	0.679
$\ln[y^{ind}(t)]$	0.282	3.42	0.002
$\ln[y^{ser}(t)]$	0.575	7.48	0.000
$\tau pit(t)$	1.387	22.0	0.000
Long-run sigma	0.0468	EC Unit Root Test	-8.139***
Wald Chi^2 test	3539.2 (0.000)		

In the long-run solution of the personal income tax function, the average personal income tax rate has highly significant positive impact. As expected, the real income of the agricultural sector is not a determinant of personal income tax revenue. This result is quite meaningful as small scale farmers do not fall into the tax brackets. The industrial output has a significant positive impact on personal income tax revenue. However, one percent increase in industrial output will result only in 0.28 percent increase in personal income tax revenue. This means that the expansion of the industrial sector has a less impact on the personal income tax. This might be due to fact that industrial sector income accumulates within corporations and less of it is distributed among the shareholders. On the other hand, one percent increase in the service sector income brings about 0.58 percent increase in the personal income tax revenue. This impact is twice larger than the impact of the industrial sector income. This is also meaning full as most of the income tax-payers work in service providing entities of the public and private sectors. The sum of the impacts of industrial and service sector incomes is quite below the unity. This indicates that the personal income tax revenue does not expand at the same rate of the economic growth.

Table 5 gives the results of the dynamic model of corporate income tax function. Again the model selection criteria permit us limiting the lag length to one. The model explains more than 99 percent of the short-term variation of the corporate income tax revenue. Dummy variables are used to control for unexplained fluctuations in 1980 and 2002. The diagnostic tests of model indicate that there is no issue of violating basic properties of the model.

Table 5

Regression Results: ADL(1,1) model of Corporate Income Tax

Dependant variable, ln(cit)

Variable	Coefficient	t value	Prob of t value
Constant	-1.784	-2.77	0.010
ln[cit (t-1)]	0.555	4.07	0.000
$\ln[y^{agri}(t)]$	0.438	2.66	0.013
$\ln[y^{agri}(t-1)]$	-0.362	-2.52	0.018
$\ln[y^{ind}(t)]$	0.512	3.78	0.001
$\ln[y^{ind}(t-1)]$	-0.268	-2.06	0.049
$\ln[y^{ser}(t)]$	0.391	5.72	0.000
$\ln[y^{ser}(t-1)]$	-0.261	-3.12	0.004
τcit(t)	0.553	22.5	0.000
τcit(t-1)	-0.292	-3.75	0.001
1980	-0.161	-2.96	0.006
2002	-0.124	-2.46	0.020
R^2	0.993	ARCH 1-1 F test	1.520 [0.229]
DW	1.95	Normality Chi^2 test	1.513 [0.469]
n	40	Hetero F test	0.739 [0.722]
AR 1-2 F test	0.938 [0.404]	RESET F test	1.760 [0.196]

Table 6

Solved Long-run Solution of the Personal Income Tax Function Dep. var: ln(cit)

Variable	Coefficient	t value	Prob of t value
Constant	-4.012	-9.25	0.000
$\ln[y^{agri}(t)]$	0.170	1.02	0.314
$\ln[y^{ind}(t)]$	0.548	3.00	0.005
$\ln[y^{ser}(t)]$	0.291	1.77	0.086
τcit(t)	0.589	8.72	0.000
Long-run sigma	0.101	Error Unit Root Test	-3.258*
WALD test Chi^2	734.3 (0.000)		

The long-run solution of the corporate income tax revenue function also generates an interesting result. The agricultural sector is insignificant in explaining corporate income tax too. The industrial sector output has a highly significant positive impact on the corporate income tax revenue. One percent increase in industrial sector income increases corporate income tax by 0.55 percent. The corporate income is relatively highly responsive to industrial sector output. This is might be due to the accumulation of profits within corporations as undived profits among shareholders.

Interestingly, one percent increase in service sector output increases corporate income tax revenue by only 0.29 percent which is only marginally significant. The corporate income tax generates the largest part of the income tax revenue of Sri Lanka. Its less responsiveness to service sector output is one of the serious issues in the tax system of Sri Lanka as the service sector is the fastest growing sector in the economy at present. One may be interested to know why the expansion of services sector of the economy does not contribute to the collection of corporate tax revenue.

5. Discussion

The insignificance of the agricultural sector output in both personal and corporate income tax functions indicates that income tax revenue of the country does not depend on its agricultural sector. This might be due to low income earning small scale holding in the agricultural production. Therefore, an increase in the real income of the agricultural sector does not increase income tax revenue. As the agricultural output is quite large in the economy, its non-responsiveness to both personal and corporate income taxes can be one reason for the non-buoyancy of Sri Lanka's tax system.

In the long-run, personal income tax has a higher responsiveness to service sector income than to the industrial sector income. This might be due to the fact that more of the service sector output is distributed among its employees while more of industrial output accumulates within corporations as undivided profits. Further, high income earning public sector workers may also contribute to high responsiveness of service sector income to the personal income tax collection.

The corporate income tax function is less responsive to service sector income compared to industrial sector income. If industrial sector income accumulates with companies as undivided profits among shareholders, the companies pay high corporate taxes. The less responsiveness of corporate income tax to service sector income may indicate that service sector companies are not established as large corporations which accumulate corporate profits. This point warrants further research on corporate profits of the service sector and division of profits among shareholders. If the service companies divide their profits among shareholders and workers as bonuses, the service sector income may report less contribution to corporate tax revenue.

6. Conclusion

In order to find reasons for the non-buoyancy of Sri Lanka's tax system, we estimate personal income and corporate income tax functions of Sri Lanka for the period 1974-2013. We found that agricultural sector expansion has no real impact on personal income tax and corporate income tax collections. This non-responsiveness of income taxes to agricultural real output can be one reason for non-buoyancy and perhaps for the decrease in tax revenue to GDP ratio. Personal income tax has a higher responsiveness to service sector income than the industrial sector income. However, the corporate income tax is more responsive to industrial output than to service sector output. This less

responsiveness of corporate tax to service sector income can be one major reason for declining tax ratio as the service secor is the fastest growing sector in the economy. The insignificance of the agricultural output and low responsiveness of industrial and service sector income in both personal and corporate income tax functions provide evidence and basis for declining tax ratio in Sri Lanka.

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