An Estimation of Laffer Curve in the Sultanate of Oman. Does Oman have an Optimal Total Tax Rate?

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***Abstract*—This paper aims to estimate the existence, shape of a Laffer curve and to examine the impact of the Total Tax and Contribution Rate (TTCR) on Total Tax Revenue (TTR) in the Omani economy over the period 2007–2024. Standard theoretical constructs are employed, modeling corporate tax revenue as a quadratic function of the TTCR. Empirical results, derived from non-linear regression analysis, indicate that the quadratic term of the tax rate is statistically significant and correctly signed, confirming the existence of a bell-shaped Laffer Curve in the Omani context. The findings show that when the tax rate is below 25.9%, there is a positive and significant relationship between tax rates and tax revenue. However, when the rate exceeds 25.9%, the relationship turns negative, suggesting that higher rates beyond this point reduce revenue. These results imply that during the period 2014–2018, Oman was operating on the right side of the Laffer Curve, and could have achieved higher tax revenues with lower tax rates. Therefore, it is recommended that policymakers reform the tax system by gradually adjusting corporate tax rates to align with the identified optimal level. To enhance competitiveness within the Gulf Cooperation Council (GCC) region, the study suggests that the optimal tax rate for maximizing corporate tax revenue in Oman should not exceed 25.9%. Finally, the estimated Laffer Curve may serve as a practical tool for fiscal and budgetary planning, offering policymakers a framework to optimize revenue while supporting private sector growth.**

***Keywords*—tax rate, tax revenue, Laffer curve, quadratic function, sultanate of Oman**

I. Introduction

The current structure of the tax system in the Sultanate of Oman highlights its limited competitiveness compared to other Gulf Cooperation Council (GCC) countries, primarily due to rising total tax rates. Over recent years, tax rates and fees have increased in both scope and variety, creating potential negative impacts on the growth and development of the private sector. While the government's efforts to respond to economic challenges—particularly the drop in oil prices—are understandable, the continued imposition of taxes and administrative fees has led to a higher overall tax burden. This trend may weaken private sector performance, reduce investment, and ultimately lead to lower tax revenue collection, undermining the very goals the tax policy aims to achieve

This study aims to fill this gap by pursuing the following objectives:

1) To estimate and analyze the relationship between the total tax rate and total tax revenue in Oman.
2) To derive the Laffer Curve for the Omani economy.
3) To assess the impact of higher total tax rates on overall tax revenue.
4) To identify the optimal total tax rate that maximizes revenue without hindering private sector growth and sustainable development.
5) To evaluate Oman's tax competitiveness in comparison to other GCC countries.

II. Literature Review

Taxation is a compulsory contribution to government revenue, levied on individual income, corporate profits, or added to the cost of certain goods, services, and transactions. Taxes are not voluntary payments or donations but are legally enforced obligations. Failure to comply with tax requirements can lead to legal prosecution, penalties, or other sanctions (Cerekas & Gumuliauskas, 2012).

According to the Laffer Curve hypothesis, economic activity is a decreasing function of the tax rate. This theory suggests that while tax revenue initially increases with rising tax rates, beyond a certain point, further increases in the tax rate lead to declining revenue due to disincentivized economic activity (Heijman *et al.,* 2005). At higher tax rates, the negative behavioral responses—such as reduced work effort, investment, or compliance—begin to outweigh the benefits of increased rates.

Fig. 1 illustrates the hypothetical Laffer Curve, typically represented as an inverted U-shape. The peak of the curve, denoted as point B, corresponds to the optimal tax rate (A1)—the rate that maximizes total tax revenue. The curve reflects the logical extremes: at a 0% tax rate, no revenue is generated, and at a 100% tax rate, economic activity collapses due to the lack of incentive, again resulting in zero revenue. Therefore, the relationship between tax rates and revenue is parabolic.

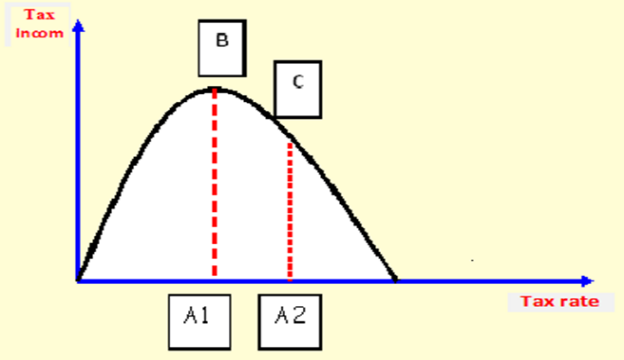

Fig. 1. Typical Laffer curve: tax kills tax assumption.

Cerekas and Gumuliauskas (2012) applied a binomial regression model to examine the relationship between tax rates and budgetary income in the Euro (EUR) region. Their analysis supports the Laffer Curve hypothesis, demonstrating a bell-shaped relationship. Both the VAT revenue function and the labor tax revenue function were found to be parabolic,

indicating that the efficiency of the tax system declines as tax rates increase. Additionally, labor tax revenue was shown to be significantly influenced by both the tax base and the tax rate, with the coefficient signs aligning with theoretical expectations.

Sedaghat Kalmarzi and Mousavi (2014), estimated the Laffer Curve for the Iranian economy using a threshold regression method. Their findings confirm that when the tax rate is below a certain threshold (0.0848), there is a significant positive relationship between the tax rate and tax revenue. However, when the tax rate exceeds this threshold, the relationship becomes significantly negative. This implies the existence of a tipping point beyond which higher taxes reduce overall revenue.

Clausing (2007) studied variations in corporate income tax revenue as a percentage of GDP among OECD countries from 1979 to 2002. The model included key variables such as the statutory tax rate, the breadth of the tax base, corporate profitability, and the share of the corporate sector in GDP. The main finding revealed a parabolic relationship between tax rates and revenue, suggesting a revenue-maximizing corporate tax rate of approximately 33%. The study also concluded that this optimal rate tends to decrease for smaller and more globally integrated economies.

Stinespring (2009a) applied linear, log-log, and semi-log econometric models to assess the impact of corporate income tax rates on tax revenue at the state level in the United States during the period 1992–2011. His analysis indicated that in 2002, eight states were taxing on the right side of the Laffer Curve (i.e., beyond the revenue-maximizing rate), and by 2007, this number had increased to 22. The results support the existence of a Laffer Curve for state-level corporate taxes.

Brill and Hasset (2007) investigated the relationship between changes in corporate tax receipts and tax rates in developed countries, including Ireland, Switzerland, and Norway. Using second-order dynamic regression models with lags, their analysis incorporated four variables: corporate tax revenue as a percentage of GDP, tax rate, corporate profitability, and corporate sector share. They found evidence supporting the presence of a Laffer Curve in corporate taxation during most of the sample period.

Edwards and Rangel (2007) analyzed the dynamic responses to corporate tax cuts and concluded that the primary driver behind increased corporate tax revenue was the behavioral response of taxpayers to lower tax rates. Reduced tax rates led businesses to report higher profits, thereby increasing tax revenues. Additionally, tax policy was shown to influence foreign direct investment, corporate borrowing, transfer pricing, dividend and royalty payments, and research and development activities. The study emphasized that raising corporate tax rates can discourage investment and capital inflow, leading to a reduction in tax revenue.

III. Materials and Methods

The goal of Omani government is to set such tax rates, which would be acceptable for the business institutions at the same time maximizing its revenue from corporate tax and fees. hence, drawing on the existing literature and following the work by (Clausing, 2007), (Brill and Hasset, 2007), (Chris and Rangel, 2007), and (Stinespring, 2009a,b), we specify the following non-linear multiple regression model that allowed us to estimate Laffer curve and to identify the impact of the total tax rates on the total tax revenue in Oman.

$$TTR/GDPt = \alpha + \beta_1 (TTCRt) + \beta_2 (TTCR_{2t}) + \beta_3 (CP_t) + et \quad (1)$$

$$TTR/GDP_t = \alpha + \beta_1 (TTCRt) + \beta_2 (TTCR_{2t}) + e_t \quad (2)$$

$$TTR/GDP_t = \alpha + \beta_1 (TTCR_{t-1}) + \beta_2 (TTCR_{2t-1}) + e_{t-1} \quad (3)$$

where:

TTR/GDP_t = Total Tax Revenue in period "t" as percentage of GDP (the total revenue from corporate and property taxes, fees and licenses, excluding service charges)

$TTCR_t$ = Total Tax and Contribution Rate

$TTCR_{t-1}$ = Total Tax and Contribution Rate in period (t−1), as suggested by (Brill and Hasset, 2007; Edwards, 2007).

CP_t = Growth rate of Corporate Profitability in period "t".

et = represents an error term that is approximately normally distributed with a variance of ϭ2 – i.e., et ~ N (0, ϭ2)—and it is assumed that $B_1 > 0$, $B_2 < 0$.

This study uses annual time-series data covering the period 2007 to 2024, sourced from the PwC database, World Bank database, and the National Centre for Statistics and Information (NCSI) Yearbook. Key variables include total tax revenue, corporate tax rates, and macroeconomic indicators such as corporate profits and GDP.

All computations and statistical analyses were performed using Microsoft Excel and EViews 10 software. The model was estimated using non-linear regression techniques to evaluate the presence and shape of the Laffer Curve in the context of Oman's corporate tax system

IV. Result and Discussion

The primary results of the regression based on Model (1) are presented in Table 2. The initial estimation suggests that the model explains approximately 76% of the variation in total tax revenue, as indicated by the R-squared value. This demonstrates a strong fit and supports the relevance of the selected explanatory variables.

Furthermore, the Durbin-Watson statistic is calculated to be 1.8, indicating no significant problem of serial correlation. As noted by Vebbek (2004, pp. 102–104), a Durbin-Watson value below 1.5 would suggest the presence of positive first-order serial correlation, which is not the case here.

The regression results show: a positive and statistically significant coefficient on the corporate tax rate, and a negative and statistically significant coefficient on the squared tax rate. This pattern confirms the expected inverted-U shape of the Laffer Curve, suggesting that tax revenue increases with the tax rate up to a certain point, after which further increases begin to reduce total revenue. Additionally, the coefficient on corporate profits is positive but very small (0.0004), potentially reflecting the impact of economic slowdowns, tightening tax regulations, or other unfavorable macroeconomic factors. These conditions may have led to reduced business activity or an exodus of companies from the market, thereby dampening the expected

revenue effect from corporate profits.

Taken together, these findings provide strong empirical support for the existence of a Laffer Curve relationship between corporate tax rates and tax revenues in Oman. This implies that beyond a certain tax rate, further increases may be counterproductive and could reduce government revenue.

Table 1. Results of model (1): TTR/GDPt = α + β1 (TTCRt)+ β2(TTCR2t) + β3 (Corporate Profitability)t + et

Variables	Coefficient	t-Statistic
Constant	−61.60325	−2.61
Tax rate	5.110695	2.67*
$(\text{Tax rate})^2$	−0.098213	−2.55*
CPG	0.00035	1.52
	R-squared: 0.76	D.W Stat: 1.8

* Significant at 5% level of significance.

The results of model 2 in Table 2 suggest that despite the fact that the coefficient b1 and b2, which represent tax rate and tax rate squared, carry the expected signs that confirm the result obtained by the first model and both coefficients are significant at the ten per cent level of significance. However, since corporate tax rate changes can happen mid-year, and may affect revenues with a lag. Hence, we re-estimate same sets of specifications but with one-year lag for the corporate tax rate. The results of the re-estimation suggest that all variables carry the correct signs and the equation seems to be sufficient as evident from the values of adjusted R2 and the "t" statistics. Further, during the period 2010–2024 the Durbin h statistic does not show any significant problem of serial correlation at the five per cent level of significance and over all, the equation is suitable as evident by the fact that the F test. Finally, the regression results also, show that the coefficient B1 and B2 that represent tax rate and tax rate squared are statistically significant at the five per cent level of significance.

Table 2. Results of non-linear regression models (Tax Rate - one Year Lagged)

Results of model: $TTR/GDP = \alpha + \beta\ *(TTCR) + \beta\ *(TTCR^2)$			**Results of model: Tax Rate - 1 Year Lagged $TTR/GDP = \alpha + \beta\ *(TTCR) + \beta\ *(TTCR^2) + e$**		
variables	Coefficient	t-Statistic	variables	Coefficient	t-Statistic
Constant	−35.11216	−1.56	Constant	−54.63884	−2.6*
Tax rate	3.003207	1.66	Tax rate_(t-1)	4.615827	2.7*
$(\text{Tax rate})^2$	−0.056577	−1.54	Tax rate $(t-1)^2$	−0.089411	−2.6*
R-squared	0.63	-	R-squared	0.68	-
	Durbin-Watson stat: 1.7			Durbin-Watson stat: 1.8	

* Significant at 5% level of significance.

Accordingly, two points raised from our investigation: first the lag form is somewhat stronger, as evidenced by higher quality of the fit; second lag form is appropriate for estimation a laffur curve; third, Important point of the results is that quadratic term in tax rate is significant and correctly signed, thus confirming a bell-shaped Laffer curve in Omani economy. Accordingly, we can calculate tax rates which maximizing corroborate tax revenue. This is done by finding derivate of Eq. (3) and setting the derivate to zero. We found that revenues maximizing tax rate is approximately 25.9 in one year–lag model.

Maximize $(TTR/GD_{Pt}) = -54.638 + 4.615\ TTCR_{t-1} - 0.089 TTCR_{2t-1}$

$0 = 4.615 - 0.089(2)\ TTCR_{t-1}$ "→" $- 4.615 = -0.178$

$TTCR_{t-1}$ "→" $TTCR_{t-1} = 25.9$

To sum up, the estimates of the dynamic model are virtually identical, with a positive and significant coefficient on the tax rate, and a negative and significant coefficient on the tax rate squared, a pattern consistent with the Laffer curve shape, which illustrated in Figs. 2 and 3.

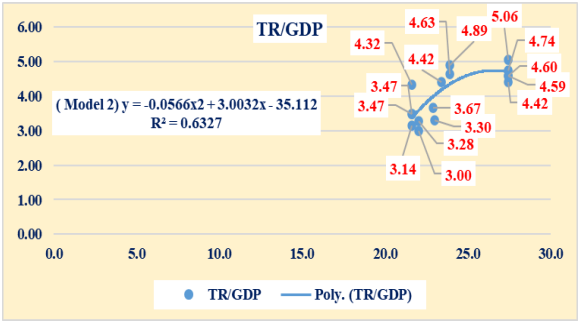

Fig. 2. Model 2, comparison of the estimated static and dynamic Laffur curves.

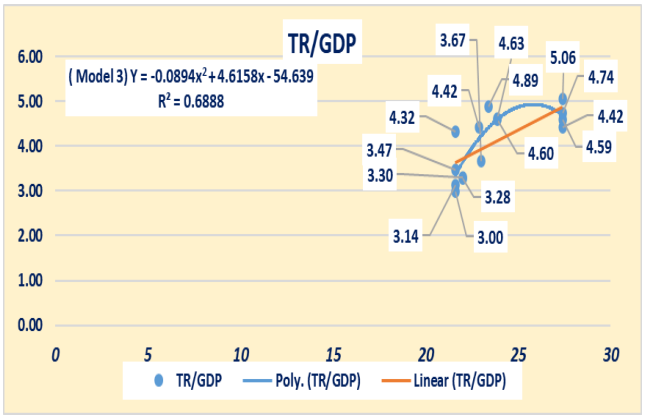

Fig. 3. Model 3, comparison of the estimated static and dynamic Laffur curves.

V. Conclusion

The main objectives of this study were to examine the impact of the Total Tax and Contribution Rate (TTCR) on Total Tax Revenue (TTR), to identify the optimal tax rate, and to empirically test the existence and shape of the Laffer Curve in the context of the Omani economy.

Using a linear regression model with a one-year lag, the empirical findings reveal that the quadratic term of the tax rate is statistically significant and correctly signed, thus confirming the existence of a bell-shaped Laffer Curve in Oman. This suggests that tax revenue initially increases with higher tax rates but begins to decline beyond a certain threshold—consistent with Laffer Curve theory.

From a regional competitiveness perspective, Oman has the highest total tax rate (27.4%) among GCC countries, significantly above the rates in Qatar (11.3%), Kuwait and Bahrain (13%), and UAE and Saudi Arabia (15%). This high tax burden may render Oman's business environment less

attractive to both domestic firms and Foreign Direct Investment (FDI), potentially limiting the expansion of the private sector.

Furthermore, the results show that when the tax rate is below 25.9%, there is a significant positive relationship between the tax rate and tax revenue. However, when the tax rate exceeds 25.9%, the relationship turns significantly negative, indicating a point beyond which higher tax rates become counterproductive.

In summary, the findings suggest that the optimal corporate tax rate in Oman should not exceed 25.9%, as doing so would likely reduce tax revenue and harm economic competitiveness. These results have important implications for tax policy reform aimed at balancing revenue generation with private sector growth and investment attraction.

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