

## US Federal and State Corporate Tax Simplification

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**Abstract:** The recent tax reform suggests that the corporate income tax rate will reduce from the current high of 35% to a new low level of 28%. Eventually, the corporate tax will become revenue neutral in the long run and raise revenues in the first few years of imposition. In other words, the proposed tax reform would mean an expansion of the U.S. corporate income tax base. In this paper, a new linear and gradual (LG) tax system has been developed and analyzed to improve the current progressive tax systems. The implied LG tax system could not only simplify our current complicated federal and state corporation tax systems but also reduce substantial processing time and managing costs for businesses and governments. The research findings include federal and state governments' tax calculations, analyses, and projections with reduced tax brackets from current systems.

**Key words:** tax reform; corporate tax; linear and gradual tax system

**JEL codes:** G18, H21, H25, H71, C02

### 1. Introduction

In the United States, the majority of business owners who have formed proprietorships and partnerships will need to pay for business incomes as their personal income taxes. Only one quarter of U.S. businesses legally established as corporations and separated from their owners, which are usually mid-sized or large-sized, are subjected to pay corporate federal and state income taxes. The annual corporate income is considered as all business costs that are subtracted from total business receipts of products and services sold over a one year period. The net taxable corporate income is a measure of the profit of the business in a corporation. Most state governments also levy corporate income taxes in the U.S. However, state taxes have been affected by many states tax concessions for the incentive of the location of corporation, the accelerated depreciation, and the greater use of tax sheltering by many corporations. Many reports and studies have indicated the declining trends of both federal and state corporate income taxes in the last few decades.

The recent tax reform proposed that corporate income tax rate will reduce from the current high of 35% to a new low level of 28%. Eventually, the corporate tax will become revenue neutral in the long run and raise revenues in the first few years of imposition. In other words, the proposed tax reform would mean an expansion of the U.S. corporate income tax base. In this paper, a new simple linear and gradual (LG) tax system has been developed and analyzed to improve the current progressive tax systems. Compared to federal personal tax situations, federal and state corporation tax systems are relatively not as complex. This paper discusses federal and

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state corporation tax simplifications with the LG Tax System.

The proposed LG tax rates can be modified simply and applied flexibly during a recession, booming economy or special situation. The differences of tax rates between the proposed LG tax system and the existing tax systems are anticipated insignificant. However, the LG tax system can be applied for the simplification on federal and state corporate tax rate brackets. The range check is introduced as a tool for testing the accuracy of the calculations. The goal of developing this new model is to simplify the existing tax systems which would benefit processing time and managing costs.

## 2. Literature Review

Ballentine (1980) examined effects of the corporation income tax that was a mainstay of the U.S. federal revenue system. He mentioned that “given the diffusion of the burden shown in this study, it is difficult to argue that the corporation income tax meets any well-defined goals of equity”. From the economic efficiency standpoint, it distorts the allocation of capital in the economy, deviates from its most productive uses and causes a waste of capital. It would eventually reduce investment to an efficient level and cause a capital shortage. He pointed out that “although all taxes induce some inefficiency in the economy, the corporate tax is shown to be the most inefficient of the major taxes”. He concluded that the value of the efficiency lost could be equivalent to half of the revenue raised by the tax.

Several linear income tax proposals have been discussed and analyzed in the last couple of decades. Slemrod, Yitzhaki, and Mayshar (1994) analyzed the optimal structure of taxation with the standard optimal linear income tax system. They investigated two-bracket piecewise linear income tax structures for the social welfare, utility, and distribution functions. They concluded that a linear income tax can provide many administrative benefits over complex graduated income tax systems and challenged the current progressive distribution policy.

Gravelle (2004) stated that over the past 50 years, corporate tax revenues fell from 5.6 to 1.2 percent of the output. The effective tax burden on the new corporate sector investment fell from 70 to 32 percent. These reductions were caused by tax rate declines, easing-up of depreciation, advancement of corporate tax shelters, and increase of Subchapter S corporations. The outcome of the lower rates enhanced productivity and eliminated substantial the deadweight loss from sectorial distortions. The paper debated that the special corporate tax rate reduction for manufacturers could worsen tax distortions and could even obstruct tax administration.

More recently, Shaviro (2009) assessed the threats to our corporate tax code and challenged conventional knowledge on the tax reform. Shaviro tried to separate the notions of the law, laid out the issues of fundamental policy, and considered the tendency of current financial situation. Based on rising globalization, capital mobility, financial innovation, and political polarization, Shaviro proposed a fair revenue-generating tax reform for stabilizing government revenue.

Continuously, Diamond and Saez (2011) opposed zero taxation of capital income from the aggregate efficiency standpoint and argued with the Atkinson-Stiglitz theorem of uniform savings rates among the tax-payers. They analyzed the optimal progressivity of earnings taxation and measured the involvement of capital income tax. They proposed high implicit marginal tax rates on low earners and used a decreasing marginal tax rate on very high earners by using the lognormal distribution system.

In addition, Kao and Lee (2013) developed a linear and gradual tax system to simplify the existing US progressive personal income taxation. The intent of this study is to eliminate the current complex Tax Tables and

Tax Rate Schedules, by simply replacing tax rates with tax calculations. The advantages of this system include simplifications on tax analysis, modification, and projection with reductions of tax processing time and management cost for individuals, businesses, and government entities.

### 3. Models

The existing federal corporation tax rates are presented as below.  $TI$  is taxable income and  $Y_i$  represent different levels of taxable income. The base tax rates are 0.15, 0.25, 0.34, 0.39, 0.34, 0.38, 0.35. Tax rate ( $TR$ ), marginal tax rate ( $m$ ) and tax amount ( $T$ ) are expressed in the formula below.

#### 3.1 The Current Federal Corporation Tax Rate Models

<i>If <math>TI \leq \\$50,000</math> (<math>Y_1</math>), then <math>TR = 0.15</math></i>	<i>A current tax rate is 0.15 (a flat tax rate)</i>
<i>If <math>Y_1 &lt; TI \leq Y_2</math>, then <math>T = 0.25 TI - a</math></i>	<i>A current tax or tax rate formula is <math>0.25 - a/TI</math></i>
<i>If <math>Y_2 &lt; TI \leq Y_3</math>, then <math>T = 0.34 TI - b</math></i>	<i>A current tax or tax rate formula is <math>0.34 - b/TI</math></i>
<i>If <math>Y_3 &lt; TI \leq Y_4</math>, then <math>T = 0.39 TI - c</math></i>	<i>A current tax or tax rate formula is <math>0.39 - c/TI</math></i>
<i>If <math>Y_5 &lt; TI \leq Y_6</math>, then <math>TR = 0.34</math></i>	<i>A current tax rate is 0.34</i>
<i>If <math>Y_6 &lt; TI \leq Y_7</math>, then <math>T = 0.34 TI - e</math></i>	<i>A current tax or tax rate formula is <math>0.34 - e/TI</math></i>
<i>If <math>Y_7 &lt; TI \leq Y_8</math>, then <math>T = 0.38 TI - f</math></i>	<i>A current tax or tax rate formula is <math>0.38 - f/TI</math></i>
<i>If <math>TI &gt; Y_8</math>, then <math>TR = 0.35</math></i>	<i>A current tax rate is 0.35</i>

The total levied tax amount can then be found by summing up the above equations. They contain more items and calculations within eight taxable income ranges (8 tax brackets). The tax rates remain at the same level of 34% within the range of \$335,000 ( $Y_5$ ) to \$10,000,000 ( $Y_6$ ), in which \$10,000,000 is 29.9 times as \$335,000.

These items may be reformed for further simplification reasonably.  $A, B, C, D, E$  or  $F$  is the constant of  $a, b, c, d, e$  or  $f$  times tax return numbers within its tax income range.

$$\begin{aligned} \text{Total levied tax amount} = & 0.15\sum TI + 0.25\sum TI - A + 0.34\sum TI - B + 0.39\sum TI - C \\ & + 0.34\sum TI + 0.34\sum TI - E + 0.38\sum TI - F + 0.35\sum TI \quad (1) \end{aligned}$$

#### 3.2 The Proposed Federal Corporation Tax Rate Models

(1) <i>If <math>TI \leq \\$50,000</math> (<math>Y_1</math>), then <math>TR = 0.15</math></i>	<i>A proposed tax rate is the flat tax rate of 15%</i>
(2) <i>If <math>Y_1 &lt; TI \leq Y_3</math>, then <math>TR = g + TI/h</math></i>	<i>A proposed tax rate formula or tax is <math>TR \times TI</math></i>
(3) <i>If <math>Y_3 &lt; TI \leq Y_4</math>, then <math>TR = 0.39 - c/TI</math></i>	<i>A proposed tax rate formula (to match)</i>
(4) <i><math>TI &gt; Y_4</math>, then <math>TR = m - d/TI</math></i>	<i>A proposed tax rate formula or tax is <math>TR \times TI</math></i>

The proposed four taxable income ranges reduce the existing eight taxable income ranges in half. The tax rate models increase linearly above \$50,000 and incrementally above \$100,000. The marginal tax rate ( $m$ ) may be adjusted upward or downward according to actual situations. The total levied tax amount can then be found by summing up the above formulas and shown as a simple function of  $TI$ , which is simpler than the Equation (1) with 50% reduction. The formula can be expressed as seen below.

$$\text{Total levied tax amount} = 0.15\sum TI + g\sum TI + \sum TI^2/h + 0.39\sum TI - C + m\sum TI - D \quad (2)$$

In the equation of  $TR = g + TI/h$ , tax rates change linearly corresponding with taxable incomes with a constant slope  $1/h$ . The relationship between  $TR$  and  $m$  is expressed as  $TR = m - d/TI$ , in which tax rates increase fast at first and then slow down. The slope, which is  $d/TI^2$ , is not a constant. In the proposed tax rate models,  $TR = 0.39 - c/TI$  is used for matching the existing situation during the taxable income range. For the different economic conditions or tax revenue adjustments, the base rates and slopes in the LG Tax System can be easily adjusted and

modified to desirable levels. Similarly, the formulas of  $TR = g + TI/h$  and  $TR = m - d/TI$  are also used for state corporation tax simplification.

## 4. Implications

### 4.1 Federal Corporation Tax Simplification by Linear and Gradual Tax System

#### 4.1.1 Existing Federal Tax System for Corporations

In our existing federal tax system for corporations, there are 8 tax computations, which are shown in Table 1. Their tax rates range from 15% to 35%. These taxable income ranges, rates and computations are complex, and are not easy to use when analyzing tax data such as tax rates, tax revenues, and projections. There is no any self-check tool to check if related calculations are right or not. We wish to have a simple and fair tax system to improve the existing system with a self-check tool and to reduce tax processing time and costs.

**Table 1 Federal Corporation Tax Computations (8 Tax Brackets)**

Taxable income (TI)				
Over	Not over	Tax is	The Amount is over	Tax Computation
\$0	\$50,000	15%		
50,000	75,000	\$7,500 + 25%	50,000	$7,500 + 0.25 \times (TI - 50,000)$
75,000	100,000	\$13,750 + 34%	75,000	$13,750 + 0.34 \times (TI - 75,000)$
100,000	335,000	\$22,250 + 39%	100,000	$22,250 + 0.39 \times (TI - 100,000)$
335,000	10 million	\$113,900 + 34%	335,000	$11,3900 + 0.34 \times (TI - 335,000)$
10 million	15 million	\$3,400,000 + 35%	10,000,000	$3,400,000 + 0.35 \times (TI - 10,000,000)$
15 million	18,333,333	\$5,150,000 + 38%	15,000,000	$5,150,000 + 0.38 \times (TI - 15,000,000)$
Over 18,333,333		35%		

#### 4.1.2 LG Tax Rate Formula and Calculation

Table 1 may be simplified and converted into the 3 LG formulas for the existing federal corporate tax, which are shown in Table 2. Their tax brackets are reduced from 8 to 4 or 50% of deduction. The taxable income ranges of \$50,000-75,000 and \$75,000-100,000 are combined together. A linear formula of  $y = a + bx$  is found to match the tax rates and tax data from the tax computations in Table 1 seamlessly and rationally.

$$\text{Tax rate} = 0.0775 + TI/689,655 \quad (\text{tax rate range check: } 0.15-0.2225) \quad (3)/(C2)$$

Here  $1/689,655$  (b) is a constant, which is the slope for  $y = a + bx$  from  $1/(100,000-50,000)/(0.2225-0.15) = 1/689,655$ . The tax number of 0.2225 is from  $0.34 + (13,750 - 0.35 \times 75,000)/100,000$  from Table 1. Tax rates change linearly from 0.15 at \$50,000 to 0.2225 at \$100,000).

When taxable incomes range from \$100,000 to \$335,000, a gradual tax rate formula of  $y = c - d/x$  is applied as below:

$$\text{Tax rate} = 0.39 - 16,750 / TI \quad (\text{tax rate range check: } 0.2225-0.34) \quad (4)/(C3)$$

Here, the Formula (4)/(C3) is derived from  $[22250 + 0.39 \times (TI - 100,000)]/TI$  from Table 1. Tax rates change gradually with range from 22.25% at \$100,000 to 34% at \$335,000. There is only 1% difference from 34% to 35% for  $TI$  over \$335,000, which is expressed by the Formula (5):

$$\text{Tax rate} = 0.35 - 3,350/TI \quad (\text{tax rate range check: } 0.34-0.35) \quad (5)/(C4)$$

Here, 3,350 is calculated from  $(0.35-0.34) \times \$335,000$  and changed gradually.

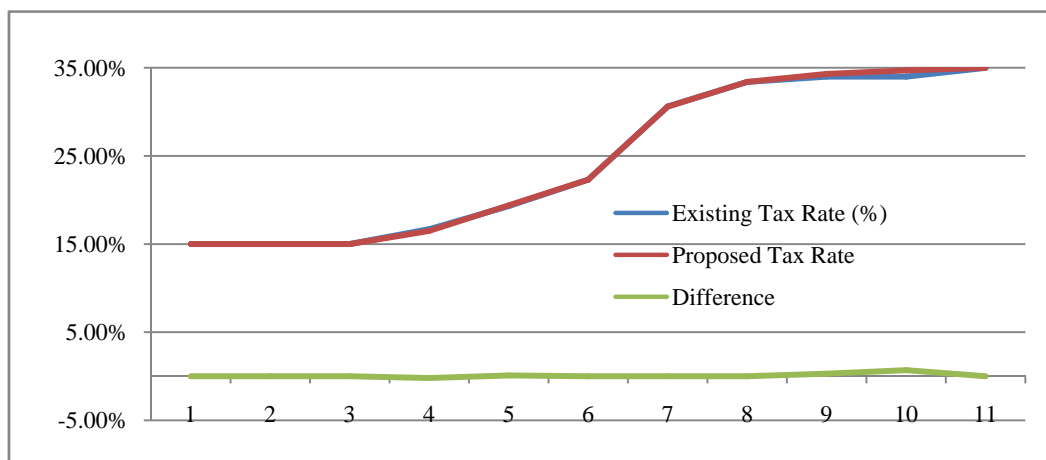
Tax rate differences from the existing federal corporation tax system (Table 1) and the LG tax system (Table 2) are shown in Figure 1, which are compatible with 0-0.2% except the taxable income range from \$335,000 to

\$10,000,000, in which the existing tax system shows the same tax rate at 34% and the LG tax system shows the different tax rates with gradual increase. It is a wide range from \$335,000 to \$10,000,000, in which there is about 30 times (10,000,000/335,000). The flat tax rate of 34% is not reasonable for a taxable income of \$335,000 or for a taxable income of \$10,000,000 to have the same tax rate at 34%, which is from the existing tax system  $[113900 + 0.34 \times (TI - 335,000)]/TI = 34\%$ .

**Table 2 LG Tax System for Federal Corporations (4 Tax Brackets)**

(The formulas simplify the tax computations in Table 1)

Tax filing status	Taxable income (TI)		TI	Tax Rate Formula	(Range check)	Tax
	Over	Not over				
(C/1)	0	50,000		0.15		
(C/2)	50,000	100,000		$0.0775 + TI/689,655$	(0.15-0.2225)	
(C/3)	100,000	335,000		$0.39 - 16,750/TI$	(0.2225-0.34)	
(C/4)	335,000			$0.35 - 3,350/TI$	(0.34-0.35)	



**Figure 1 Comparison of the Existing Federal Corporate System and the LG Tax System**

(Almost no difference in all scales from Table 1 and Table 2 after 50% reduction)

Note: Taxable income: 1 = \$1,000, 2 = \$20,000, 3 = \$50,000, 4 = \$60,000, 5 = \$80,000, 6 = \$100,000, 7 = \$200,000, 8 = \$300,000, 9 = \$500,000, 10 = \$1,000,000, 11 = \$20,000,000

#### 4.1.3 Tax Data Analysis, Projection and Tax Rate Modification

From Table 2, tax data, such as total tax or average tax rate may be calculated from taxable income data. It is not necessary to calculate tax data for all corporations at first and then add them together. Taxable income data may be used for tax projection.

$$Total\ levied\ Tax\ Amount = 0.15\sum TI_i + 0.0775\sum TI_j + \sum (TI_j^2)/689,655 + 0.39\sum TI_k - 16,750k + 0.35\sum TI_l - 3,350l = f(TI) \quad (6)$$

Here  $i, j, k$  and  $l$  are business tax filing numbers during the four taxable income ranges. The total tax Equation (6) or similar equations may be used to do total tax calculation, projection, and analysis. Tax rate or tax amount is a simple function of  $TI$ .

If the existing tax computations are used for taxable incomes over \$335,000, then the subtotal tax amount is much more complex and can be expressed as Equation (7).

$$Subtotal\ Tax\ Amount = \sum (11,3900 + 0.34(TI_1 - 335,000)) + \sum (3,400,000 + 0.35(TI_2 - 10,000,000)) + \sum (5,150,000 + 0.38(TI_3 - 15,000,000)) + \sum 0.35\ TI_4 \quad (7)$$

Where  $l_1, l_2, l_3$  and  $l_4$  are subtotal corporation numbers for taxable incomes over \$335,000. When the LG tax system is applied, the subtotal tax amount can be simplified as Equation (8).

$$\text{Subtotal Tax} = 0.35\sum TI - 3,350l \tag{8}$$

During a recession, booming economy, or special situation, LG tax rates may be reduced for job stimulations and business opportunities to promote economic growth. Conversely, LG tax rates can be increased by collecting more tax. One way is to subtract related deduction such as -1% or -3% or add such as +2% or +0.5% from the LG tax rate formulas directly. Alternately, it can further apply a linear relationship for taxable incomes from 0 to \$100,000 as shown in Table 3. The tax rate modifications from 15-35% to 10-35%, 12-37% or any necessary tax rate range such as 10-30% or 8-28% can be modified quickly and the tax brackets are reduced from 8 to 3 as shown in Table 3.

The two simple math equations of  $y = a + bx$  and  $y = c - d/x$  are used in the LG tax system, in which these constants of  $a, b, c$  and  $d$  may be modified sensibly according to actual situations. We may also design tax rates at certain taxable incomes such as tax rate as 0.15 at \$50,000 or 0.25 at \$100,000 for federal corporation tax. Hence, its linear LG formula will be  $0.05+TI/500,000$  with tax rate range check of (0.15-0.25.)

**Table 3 LG Tax Rate Modifications for Federal Corporations (3 Tax Brackets)**

Taxable Income (TI)		Tax Rates 10-35%		Tax Rates 8-28%	
		Rate formula	(Range check)	Rate formula	(Range check)
Over	Not over				
0	100,000	$0.1+TI/816,326.5$	(0.1-0.2225)	$0.08+TI/1,379,310$	(0.08-0.1525)
100,000	335,000	$0.39-(16,750/TI)$	(0.2225-0.34)	$0.32-16,750/TI$	(0.1525-0.27)
335,000		$0.35-(3,350/TI)$	(0.34-0.35)	$0.28-3,350/TI$	(0.27-0.28)

## 4.2 State Corporation Tax Simplification by Linear and Gradual Tax System

### 4.2.1 Existing Alaska Corporate Tax System and the LG Tax System for Corporations

Alaska tax rates for corporations are graduated from 1% to 9.4% in increments of \$10,000 of taxable income. The maximum rate of 9.4% applies to a taxable income of \$90,000 and over. The Alaska corporation tax system is shown in Table 4. It has 10 brackets, which are the most complex in all US state tax systems.

When a LG tax rate formula is used to match the tax rates from taxable income ranges from 0 to \$100,000, Table 4 contains the 10 tax computations with a simple linear relationship of  $y = a + bx$  which is matched with the existing situations:

$$\text{Tax rate} = 0.006 + TI/2,066,116 \text{ (tax rate range: } 0.006-0.0544) \tag{9}$$

Here  $1/2,066,116$ , which is the slope for  $y = a + bx$ , is derived from  $1/100,000/(0.0544-0.006)$ . The value 0.0544 is derived from the original tax computation in tax rate format  $0.094+(4,500-0.094 \times 90,000)/100,000 = 0.0544$ . The number 0.06 is from their graph of  $y$  (tax rate) =  $a + bx$  (TI) directly. When taxable incomes are over \$100,000, the original tax computation is converted into its tax rate format:

$$\begin{aligned} \text{Tax Amount} &= 4,500 + 0.094 \times (TI - 90,000) = 0.094 \times TI - 3,960 \\ \text{or Tax rate} &= 0.094 - 3,960/TI \end{aligned} \tag{10}$$

Table 5 shows the LG Tax System used for Alaska corporation tax, with the two formulas and tax rate range checks. The tax rate differences from Tables 4 and 5 are shown in Table 6. The existing Alaska corporation computations and the LG tax system, which are very compatible at 0-0.1%, except the flat tax rate at 1% from 0 to \$10,000. The original 10 tax brackets have been reduced to 2 with 80% of deduction, which provides an easy way for tax calculation, analysis and projection.

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**Table 4 Existing Alaska Corporation Tax Rate Table (10 Tax Brackets)**

Taxable Income (TI)		Tax Amount	Plus	The Amount Over	Tax Computation
At Least	But Less Than				
0	10,000	0	1%	0	$0.01 \times TI$
10,000	20,000	100	2%	10,000	$100 + 0.02 \times (TI - 10,000)$
20,000	30,000	300	3%	20,000	$300 + 0.03 \times (TI - 20,000)$
30,000	40,000	600	4%	30,000	$600 + 0.04 \times (TI - 30,000)$
40,000	50,000	1,000	5%	40,000	$1,000 + 0.05 \times (TI - 40,000)$
50,000	60,000	1,500	6%	50,000	$1,500 + 0.06 \times (TI - 50,000)$
60,000	70,000	2,100	7%	60,000	$2,100 + 0.07 \times (TI - 60,000)$
70,000	80,000	2,800	8%	70,000	$2,800 + 0.08 \times (TI - 70,000)$
80,000	90,000	3,600	9%	80,000	$3,600 + 0.09 \times (TI - 80,000)$
90,000 or more		4,500	9.4%	90,000	$4,500 + 0.094 \times (TI - 90,000)$

**Table 5 LG Tax System for Alaska Corporations with Range Check (2 Brackets)**

Filing status	Taxable income (TI)		TI	LG tax rate formula	(Range check)	Tax
	Over	Not over				
(AK/1)	0	100,000		$0.006 + TI/2,066,116$	(0.006-0.0544)	
(AK/2)	100,000			$0.094 - 3,960 / TI$	(0.0544-0.094)	

From Table 5, tax data such as total tax may be calculated from taxable income data. It is not necessary to calculate each corporation tax at first and then add them together to get the total tax. Taxable incomes may be used for total tax calculation and projection. Total tax is then a function of TI.

$$Total\ Tax = 0.006 \sum TI_o + \sum (TI^2)_o / 2,066,116 + 0.094 \sum TI_p - 3,960xp \quad (11)$$

Here  $o$  and  $p$  are corporation numbers during the two taxable income ranges. Also, TI may be converted into a function of tax rate (or tax). If the existing Alaska tax system is used to figure out the total tax, the 10 tax computations in Table 4 are used, which is much more complex than the Equation (11) applying the LG tax system.

**Table 6 Comparison of Tax Rates between Alaska Tax Rate and the LG Formula**

Taxable Income (\$)	2012 Alaska tax rate (Tax/TI, Table 4)	LG formula (Table 5)	Difference
5,000	1%	0.84%	-0.2%
10,000	1%	1.08%	0.1%
15,000	1.33%	1.33%	0.0%
20,000	1.50%	1.57%	0.1%
30,000	2.00%	2.05%	0.1%
40,000	2.50%	2.50%	0.0%
50,000	3.00%	3.02%	0.0%
60,000	3.50%	3.50%	0.0%
70,000	4.00%	3.99%	0.0%
80,000	4.50%	4.47%	0.0%
90,000	5.00%	4.96%	0.0%
100,000	5.44%	5.44%	0.0%
1,000,000	9.00%	9.00%	0.0%
20,000,000	9.38%	9.38%	0.0%

During a recession, booming economy or special situation, LG tax rates may be reduced or increased according to actual situations by -0.5% or +0.3% from LG tax rate formulas directly.

4.2.2 Existing Arkansas Tax System and the LG Tax System for Corporations

The Arkansas corporation income tax rate is a graduated rate applied to the Arkansas Net Taxable Income (NTI), which is shown in Table 7. The tax computations are complex when taxable incomes are not over \$25,000. Their tax rates range from 1% to 6.5% with 6 brackets.

**Table 7 The Existing Arkansas Tax System for Corporations (6 Tax Brackets)**

Taxable Income (TI)		Tax Computation
Over	Not over	
0	3,000	$0.01 \times TI$ (Tax Table)
3,000	6,000	$0.01 \times 3,000 + 0.02 \times (TI - 3,000)$ (Tax Table)
6,000	11,000	$0.01 \times 3,000 + 0.02 \times 3,000 + 0.03 \times (TI - 6,000)$ (Tax Table)
11,000	25,000	$0.01 \times 3,000 + 0.02 \times 3,000 + 0.03 \times 5,000 + 0.05 \times (TI - 11,000)$ (Tax Table)
25,000	100,000	$940 + 0.06 \times (TI - 25,000)$
Over 100,000		$5,440 + 0.065 \times (TI - 100,000)$

The existing Corporation Income Tax Table (2 pages) for taxable incomes from \$100 to \$25,000 is provided. When the LG tax system is used, the above 6 tax brackets are reduced to 3, which is shown in Table 8. The lesser amount of tax brackets provides an easy tool for tax calculation, analysis and projection.

When a LG tax rate formula is used to match the tax rates from taxable income ranges from 0 to \$25,000, a linear relationship of  $y = a + bx$  is found:

$$\text{Tax rate} = 0.01 + TI/905,797 \quad (\text{tax rate range: } 0.01-0.0376) \quad (12)$$

Here  $1/905,797$ , which is the slope for  $y = a + bx$ , is derived from  $1/25000/(0.0376-0.01) = 1/905,797$ . The value 0.0376 is from the original tax computation in tax rate format  $[30+60+150+0.05 \times (25,000-11,000)] / 25,000 = 0.0376$ .

**Table 8 LG Tax System for Arkansas Corporations with Range Check (3 Tax Brackets)**

Filing status	Taxable income (TI)		TI	LG tax rate formula	(Range check)	Tax
	Over	Not over				
(AR/1)	0	25,000		$0.01 + TI/905,797$	(0.01-0.0376)	
(AR/2)	25,000	100,000		$0.06 - 560/TI$	(0.0376-0.0544)	
(AR/3)	100,000			$0.065 - 1,060/TI$	(0.0544-0.065)	

When TIs are over \$25,000 or \$100,000, the tax computations are converted into their tax rates:

$$\text{Tax Amount} = 940 + 0.06 (TI - 25,000) = 0.06TI - 560 \quad \text{or} \quad \text{Tax rate} = 0.06 - 560/TI \quad (13)$$

$$\text{Tax Amount} = 5,440 + 0.065 (TI - 100,000) = 0.065TI - 1,060 \quad \text{or} \quad \text{Tax rate} = 0.065 - 1,060/TI \quad (14)$$

The tax rate differences between the existing Arkansas corporation computations and the LG tax system are shown in Figure 2, which are compatible. Taxable income data may be used to calculate total tax and projection directly. Total tax is a simple function of TI.

$$\text{Total Tax} = 0.01 \sum TI t + \sum (TI^2) t / 905,797 + 0.06 \sum TI u - 560 \times u + 0.065 \sum TI v - 1,060 \times v \dots \dots (15)$$

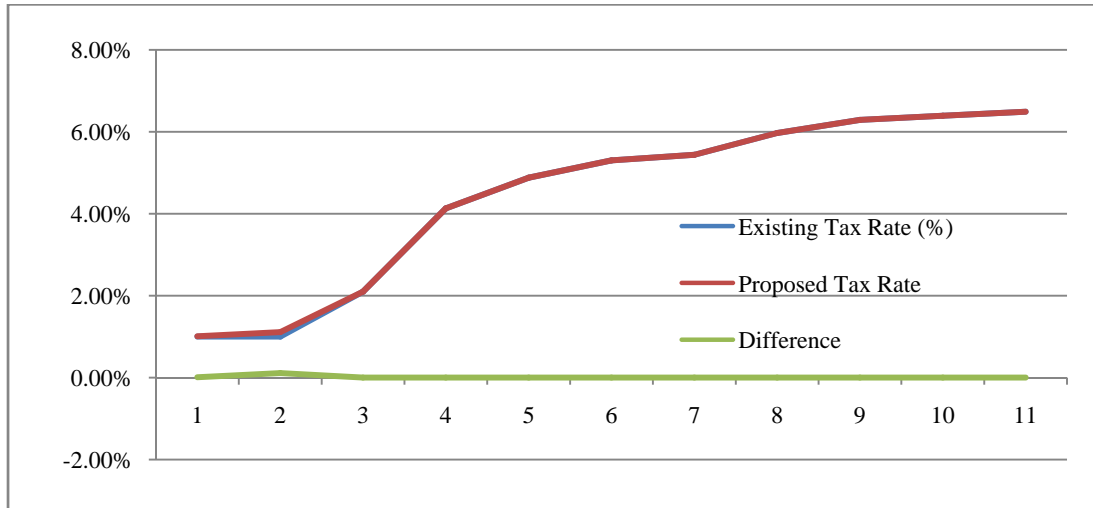
Here  $t$ ,  $u$ , and  $v$  are corporation numbers during the three taxable income ranges. The total tax Equation (15) or similar equations may be used to do total tax calculation, projection and analysis. During a recession, booming economy or special situation, LG tax rates may be modified simply.

4.2.3 Existing State Tax Systems for Corporations

State tax systems for corporations often use multi-brackets such as 6-10 tax brackets, which are too complex, or flat tax rates, which are too simple. Each state has different situations. Flat tax rates are easy but cannot cover



all taxable income ranges reasonably. More tax brackets increase complexity of a tax system, which has smoother tax rate changes and closes to a linear relationship. State tax systems for corporations (2013) are shown at [www.taxadmin.org/fta/rate/corp\\_inc.pdf](http://www.taxadmin.org/fta/rate/corp_inc.pdf). States, such as Alaska, Louisiana, Iowa, California and Minnesota have 10, 5, 4, 1 or 1 bracket, respectively, for corporations. They may be redesigned with the LG Tax System, similarly to Alaska and Arkansas.



**Figure 2 Comparison of Tax Rates between Existing Arkansas Tax and the LG Tax Systems**

Note: Taxable income: 1 = \$100, 2 = \$1,000, 3 = \$10,000, 4 = \$30,000, 5 = \$50,000, 6 = \$80,000, 7 = \$100,000, 8 = \$200,000, 9 = \$500,000, 10 = \$1,000,000, 11 = \$20,000,000

## 5. Tax Rate Design for Corporations

Flat tax rates are often used in corporation tax rate design in some state. Flat tax rates look simple and are easy to be put into operation. A flat tax rate is very simple and efficient like a sales tax rate, which does not consider different incomes. But corporations or individuals have different taxable incomes, which should relate to different tax rates rationally. It is extremely difficult to cover different taxable incomes with one or several flat tax rates. Some people prefer to have few flat tax rates to cover all corporations or individuals with different taxable incomes, which are simple but not reasonable. For example, two corporations have taxable incomes of \$30,000 and \$300,000 respectively. The initial difference is one is 10 times the amount of the other (300,000/30,000). If they pay taxes at a flat tax rate, such as 20%, there are respectively left with \$24,000 and \$240,000. The second is still 10 times the amount of the first (240,000/24,000). When they pay their taxes at 15% or 33.4% (0.39-16,750/300,000 = 0.334), respectively at their different tax rates, their remaining amounts are \$25,500 and \$199,800, respectively. The second corporation is now 7.8 times of the other (199,800/25,500). Corporations or individuals should correspond to different tax rates reasonably according to their taxable incomes. Besides tax rate and tax calculation, analysis and projection simplifications, another area is for governments and policymakers to provide fair and simple deductions, exemptions, tax rate ranges, and credits with less or no special interests in related tax policies.

Many states have flat corporation tax rates such as California (8.84%), New York (7.1%), and North Carolina (6.9%). These flat tax rates may be converted into simple linear and gradual tax rates. For example, California may be suggested to have two tax brackets, ranging from 5% to 9%. State corporation tax may be converted into

linear and gradual tax rates with 2-3 brackets, which are shown in Table 9. We may also design tax rates at certain taxable incomes such as tax rates ranging from 3% to 7% at 0-\$100,000 and 7% to 9% over \$100,000 for a state corporate tax. Then, its LG formulas will be  $0.03+TI/2,500,000$  (0.03-0.07) and  $0.09-2,000/TI$  (0.07-0.09).

**Table 9 The LG Tax System for State Corporations**

Filing status	Taxable income (TI)		Tax rate formula	(Range Check)
	Ove	Not over		
(1)	0	$Y_1$	$a_1 + b_1 x$	$(a_1 - TR_2)$
(2)	$Y_1$	$Y_2$	$a_2+b_2x$ or $c_1-d_1/x$	$TR_2 - TR_3$ (Status (2) is not necessary)
(3)	$Y_2$		$c_2 - d_2 / x$	$(TR_3 - c_2)$

## 6. Conclusion

The proposed federal and state tax simplification processes could combine all filing statuses, taxable incomes, incomes, tax rate formulas, tax rate range checks, tax rate, and tax calculations into much more simplified phases. Tax rate formulas could then connect to the related filing statuses, taxable income, LG formulas, and different income brackets. The LG tax system with much fewer brackets may be used to replace current multi-brackets or flat tax rate in corporation tax systems. Consequently, tax rate, total tax amount, and tax revenues can be calculated automatically or manually with simple procedures.

The implied LG system would provide several benefits on corporate tax procedures. The taxable income ranges can be reduced to a more reasonable, two to four levels instead of current complex brackets, i.e., the 8 brackets of federal corporation tax or the ten brackets of Alaska corporation tax or flat tax rates in Minnesota that has one flat corporate tax rate. It would streamline and balance tax rate and tax calculations. The additional advantage of the proposed LG formulas is that it would not only fine-tune corporate tax rates but could also be easily tested by tax offices and tax-payers. Corporation tax rate, total tax amount, and average tax rate are calculated directly by the LG tax system to replace the current the tax tables, reduce tax brackets, and expand uniform rate by sensible and modest formulas.

The proposed tax rates represent minor tax rate differences with the existing system that only ranges from zero to 0.2% generally. For the ease of tax rate modification, tax offices could change the rates and estimate the revised revenue quickly. Tax analysis and revenue projection would enhance the efficiency of the management and operation of tax revenue offices. In conclusion, we could benefit from using the LG system for saving tax preparation time, engaging the complex tax rate analysis, and modifying tax rate structures for different economic scenarios.

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