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List of 18 Public Finance Formulas

Public Finance

1) Average Tax Rate

$$fx \quad ATR = \frac{TP}{NI}$$

[Open Calculator !\[\]\(a870788d6ed9b8fd294b7654a8c8526b_img.jpg\)](#)

$$ex \quad 0.125 = \frac{250000}{2000000}$$

2) Budget Balance

$$fx \quad S = T - G - TR$$

[Open Calculator !\[\]\(c50c8b7b2cc2cf9ff925edec0ee94c0d_img.jpg\)](#)

$$ex \quad 703000 = 820000 - 78000 - 39000$$

3) Budget Deficit

$$fx \quad B_{def} = G_{exp} - G_{inc}$$

[Open Calculator !\[\]\(f60b7a900783ac3fd531bfd9c111be6d_img.jpg\)](#)

$$ex \quad 800 = 4100 - 3300$$



4) Cost Benefit Analysis

$$\text{fx } \text{BCR} = \frac{\sum \left(x, 0, n, \left(\frac{\text{CF}_B}{(1+(0.01 \cdot \text{DR}))^x} \right) \right)}{\sum \left(x, 0, n, \left(\frac{\text{CF}_C}{(1+(0.01 \cdot \text{DR}))^x} \right) \right)}$$

[Open Calculator !\[\]\(cbe80b694ebd74fcfe136a095b608235_img.jpg\)](#)

$$\text{ex } 2 = \frac{\sum \left(x, 0, 6, \left(\frac{200000}{(1+(0.01 \cdot 12))^x} \right) \right)}{\sum \left(x, 0, 6, \left(\frac{100000}{(1+(0.01 \cdot 12))^x} \right) \right)}$$

5) Debt to GDP Ratio

$$\text{fx } D_{\text{GDP}} = \frac{\text{TD}}{\text{GDP}}$$

[Open Calculator !\[\]\(3e2231b1ad3ca8da8658228c00dd08e0_img.jpg\)](#)

$$\text{ex } 2.4 = \frac{24000000}{10000000}$$

6) Laffer Curve

$$\text{fx } R = \text{tax} \cdot T_b$$

[Open Calculator !\[\]\(0d5ec72f61334709c3fc9450209b754f_img.jpg\)](#)

$$\text{ex } 128000 = 8 \cdot 16000$$

7) Marginal Propensity to Consume

$$\text{fx } \text{MPC} = \frac{C_{\text{gs}}}{\text{DI} \cdot (\text{R} - \text{Tax})}$$

[Open Calculator !\[\]\(b64b40baaee5acddc1eab8538ba84754_img.jpg\)](#)

$$\text{ex } 0.260181 = \frac{2300000}{130 \cdot (128000 - 60000)}$$



8) Marginal Propensity to Save 

$$\text{fx } \text{MPS} = \frac{\Delta S}{\Delta I}$$

[Open Calculator !\[\]\(e78f798d4ea5c530c9db49e7d26e6b95_img.jpg\)](#)


$$\text{ex } 0.833333 = \frac{25}{30}$$

9) Marginal Tax Rate 

$$\text{fx } \text{MTR} = \frac{\Delta \text{TP}}{\Delta \text{TI}}$$

[Open Calculator !\[\]\(05be7c7a8995decd503647c99211f7c2_img.jpg\)](#)


$$\text{ex } 2.5 = \frac{15000}{6000}$$

10) Tax Buoyancy 

$$\text{fx } \text{TB}_y = \frac{\% \Delta R}{\% \Delta \text{GDP}}$$

[Open Calculator !\[\]\(fe3aebe81acea8d45108cd2768939da7_img.jpg\)](#)

$$\text{ex } 5 = \frac{20}{4}$$

11) Tax Burden for Customers 

$$\text{fx } \text{TB}_r = \frac{E_S}{E_D + E_S}$$

[Open Calculator !\[\]\(899d8b7697d64725bf017d3296cfcf1b_img.jpg\)](#)

$$\text{ex } 0.39759 = \frac{0.33}{0.50 + 0.33}$$



12) Tax Burden for Suppliers

$$\text{fx } \text{TB}_r = \frac{E_D}{E_D + E_S}$$

[Open Calculator !\[\]\(e2376d476d06eb31946dc01a69a4403a_img.jpg\)](#)

$$\text{ex } 0.60241 = \frac{0.50}{0.50 + 0.33}$$

13) Tax Elasticity

$$\text{fx } \text{TE} = \frac{\% \Delta R}{\% \Delta E}$$

[Open Calculator !\[\]\(0b5e7e25e8775f7e7e80906ada4f0021_img.jpg\)](#)

$$\text{ex } 6.666667 = \frac{20}{3}$$

14) Tax Incidence for Customers

$$\text{fx } \text{TI} = 100 \cdot \left(\frac{E_S}{E_D + E_S} \right)$$

[Open Calculator !\[\]\(bd3b31712ad9bab5a241210fa6925cdd_img.jpg\)](#)

$$\text{ex } 39.75904 = 100 \cdot \left(\frac{0.33}{0.50 + 0.33} \right)$$

15) Tax Incidence for Producers

$$\text{fx } \text{TI} = 100 \cdot \left(\frac{E_D}{E_D + E_S} \right)$$

[Open Calculator !\[\]\(7bc43b319a082987e20f7bf78f4bab80_img.jpg\)](#)

$$\text{ex } 60.24096 = 100 \cdot \left(\frac{0.50}{0.50 + 0.33} \right)$$



16) Tax Liability

$$fx \quad TL = TB \cdot 0.01 \cdot tax$$

[Open Calculator !\[\]\(d3fb9f94af8b26d1c844efa9a98805b0_img.jpg\)](#)

$$ex \quad 4000 = 50000 \cdot 0.01 \cdot 8$$

17) Tax Multiplier

$$fx \quad TM = \left(\frac{1 - MPC}{MPS} \right)$$

[Open Calculator !\[\]\(e1d6102fe77919492c04879c8450f1f5_img.jpg\)](#)

$$ex \quad 0.870588 = \left(\frac{1 - 0.26}{0.85} \right)$$

18) Tax Revenue

$$fx \quad T = TL \cdot Tp$$

[Open Calculator !\[\]\(ab4e2b3fc7e7887b7a72f548aa6f5e60_img.jpg\)](#)

$$ex \quad 800000 = 4000 \cdot 200$$



Variables Used

- **% ΔE** Change in Economic Activity
- **% ΔGDP** Change in GDP
- **% ΔR** Change in Tax Revenue
- **ATR** Average Tax Rate
- **B_{def}** Budget Deficit
- **BCR** Benefit Cost Ratio
- **C_{gs}** Consumption
- **CF_B** Cash Flow of Benefits
- **CF_C** Cash Flow of Costs
- **D_{GDP}** Debt to Gdp
- **DI** Disposable Income
- **DR** Discount Rate
- **E_D** Elasticity of Demand
- **E_S** Elasticity of Supply
- **G** Government Consumption
- **G_{exp}** Government Expenditure
- **G_{inc}** Government Income
- **GDP** Gross Domestic Product (GDP)
- **MPC** Marginal Propensity to Consume
- **MPS** Marginal Propensity to Save
- **MTR** Marginal Tax Rate
- **n** Number of Periods



- **NI** Net Income
- **R** Revenue
- **S** Budget Balance
- **T** Tax Revenue
- **tax** Tax Rate
- **Tax** Tax Imposed
- **Tb** Taxable Base
- **TB** Tax Base
- **TB_r** Tax Burden
- **TB_y** Tax Buoyancy
- **TD** Total Debt of Country
- **TE** Tax Elasticity
- **TI** Tax Incidence
- **TL** Tax Liability
- **TM** Tax Multiplier
- **Tp** Taxpayer
- **TP** Tax Paid
- **TR** Transfer Payments
- **ΔI** Change in Income
- **ΔS** Change in Savings
- **ΔTI** Change in Taxable Income
- **ΔTP** Change in Taxes Paid






Constants, Functions, Measurements used

- **Function:** **sum**, sum(i, from, to, expr)
Summation or sigma (Σ) notation is a method used to write out a long sum in a concise way.



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