Macro Models: un APP for Macroeconomic Models. User Manual 1.0

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MACRO MODELS

UN APP FOR MACROECONOMIC MODELS

User Manual

Version 1.0

Very Preliminary Version

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The Income-Expenditure Model

1. Introduction

This paper is simply a user manual of un APP that simulates the widely used Macroeconomic Models.

2. Income Expenditure Model

1. Legenda

Input

$\bar{C}$	Autonomous (exogenous) Consumption
I_0	Net Investment
NX	Net Export
C	Marginal propensity to consume

G	Government Spending
TR	Net Government Transfers
t	Income tax rate

Output

NMP	Net Marginal Propensity to consume
Multiplier	Keynesian Multiplier
Eq. Income	Equilibrium Income
Eq. Consumption	Equilibrium Consumption
Balance	Government Surplus
ΔIncome	Income Variation

Graph

EAD	Autonomous Aggregate Demand
Y	Income
tY	income tax
C	Consumption
I	Investment
D	Government Surplus
B	Government Debt

a. The Model

Y is the Income. The Aggregate Demand is given by

[1.] $AD = G + NX + I + C$

Where

[2.] $G = \bar{G}$

[3.] $NX = \overline{NX}$

[4.] $I = I_0$

The direct Tax Revenue is equal to

[5.] $TA = tY$

where t is the income tax rate

TR is the Government Transfers

[6.] $TR = \overline{TR}$

The Disposable Income is defined as

[7.] $YD = Y + TR - TA$

[8.] $YD = Y + TR - tY$

[9.] $YD = (1 - t)Y + TR$

The consumption function depends on Disposable Income (YD)

[10.] $C = \bar{C} + cYD$

[11.] $C = \bar{C} + c\big((1 - t)Y + TR\big)$

[12.] $AD = C + I + NX + G + TR$

[13.] $AD = \bar{C} + c\big((1 - t)Y + TR\big) + I_0 + G + NX$

[14.] $AD = \bar{C} + c\big((1 - t)Y_t + TR\big) + I_0 + G + NX$

[15.] $AD = \bar{C} + cTR + I_0 + G + NX + c(1 - t)Y$

In Equilibrium: Supply(Y)= Demand (AD)

[16.] $Y = AD$

a. Results

Equilibrium Income

[17.] $Y_E = \frac{1}{1-c(1-t)}(\bar{C} + cTR + I_0 + G + NX)$

[18.] $\overline{AD} = \bar{C} + cTR + G + NX + I_0$

Multipliers

Expenditure's multiplier

[19.] $\frac{dY}{d\bar{C}} = \frac{dY}{dI_0} = \frac{dY}{dNX} = \frac{dY}{dG} = \frac{1}{1-c(1-t)}$

Transfer's multiplier

[20.] $\frac{dY}{dTR} = \frac{c}{1-c(1-t)}$

Tax multiplier

[21.] $\frac{dY}{dt} = \frac{-c}{(1-c(1-t))^2}$

Balance Surplus (BS) is equal to

[22.] $BS = TA - G - TR$

[23.] $BS = tY - G - TR$

[24.] $BS = t\frac{1}{1-c(1-t)}(G + cTR + I_0 + NX + C) - G - TR$

3. References

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Samuelson P. (1939) Interaction between the Multiplier Analysis and the Principle of Acceleration The Review of Economic and Statistics, Vol 21. No. 2 pp 75-78

4. APPENDIX

Results Table 1.1

Net Marginal Propensity	$c(1-t)$
Multiplier	$\frac{1}{1-c(1-t)}$
Equilibrium Income	$Y_E = \frac{1}{1-c(1-t)}(\bar{C} + cTR + I_0 + G + NX)$
Consumption	$\bar{C} + c\big((1-t)Y_E + TR\big)$
Balance Surplus	$BS = tY_E - G - TR$