

Glossary of Mathematical Symbols in Order of Appearance

Chapter 1

- y exponential average
- x rate of change (in nominal spending) or rate of inflation or rate of return
- k parameter setting the elasticity of an exponential average

Chapter 2

- m_n money supply
- p_n price level
- p_n^e expected value of p_n
- y_n volume of output
- d_n excess demand/liquidity measured in terms of real money balances
- μ demand for real money balances
- \bar{y} volume of output when $d_n = 0$

Chapter 3

- PUR^j intermediate consumption of goods and services of business j
- I^j investment of business j (or of commercial bank k)
- W^j wages paid out by business j (or by commercial bank k)
- DIV_o^j dividends paid out by business j (or by commercial bank k)
- INT_o^j interests paid out by business j (or by commercial bank k)
- A_o^j securities amortized (or redeemed) by business j (or by commercial bank k)

SEC_0^j	securities bought by business j (or by commercial bank k)
dM^j	change in the money balance held by business j
D^j	total applications of funds of business j (excluding dM^j)
REV^j	sales of goods and services of business j (or of commercial bank k)
DIV_i^j	dividends received by business j (or by commercial bank k)
INT_i^j	interests received by business j (or by commercial bank k)
A_i^j	securities amortized (or redeemed) to business j (or to commercial bank k)
SEC_i^j	securities sold or issued by business j (or by commercial bank k)
dL^j	new bank loans raised by business j from commercial banks
dL^j	new loans raised by business j from the central banks
R^j	total sources of funds of business j (excluding dL^j and dL^j)
M	broad money supply
M_M	currency
M_S	deposits with commercial banks
M_{bb}	money balances held by households
M_b	money balances held by the business sector (including commercial banks)
INC_{bb}	aggregate income of households
C_{bb}	aggregate consumption of households
SAV_{bb}	aggregate savings of households
CF_b	retained operating earnings of the business sector
D	aggregate nominal spending (cash outlays) of all sectors
R_T	aggregate cash receipts of all sectors
M_T	transaction balances
M_P	precautionary balances
V	transactions velocity of M
t	point on the <i>physical</i> (or <i>calendar</i>) time scale
V_P	transactions velocity of precautionary balances
V_T	transactions velocity of transaction balances
$f(x)$	demand for money function in Allais's 1953 formulation

$g(x)$	supply of money function in Allais's 1953 formulation
M_D	desired money balances
T	response period (elementary average planning period for all agents)
f_m	lower limit of the demand for money function
f_M	upper limit of the demand for money function
g_m	lower limit of the supply of money function
g_M	upper limit of the supply of money function
D_e	aggregate nominal spending in a stationary equilibrium

Chapter 4

r	continuous constant periodic rate of decay in an exponential average
V_0	transaction velocity of money in a stationary state
φ_t	notional function used to introduce the relationship between the physical and the psychological time scale as well as the variability of the velocity of money and that of the rate of memory decay
T_0	response period in a stationary state
t'	a point on the <i>psychological</i> time scale
χ	continuous rate of memory decay along the physical time scale
χ_0	continuous rate of memory decay along the psychological time scale (or in a stationary state)
Z	coefficient of psychological expansion
ϕ_0	scaling parameter (ratio of desired balances to nominal spending when $Z = 0$)
$\Psi(Z)$	relative desired balances, a logistic function of Z
b	parameter in the function Ψ , setting its maximum value $\phi_0(Z)$
α	parameter in the function Ψ , setting the slope of $\phi_0(Z)$ the asymptotic limit of its elasticity with respect to Z
z	dynamic equilibrium rate ("perceived" rate of change)
\bar{x}	average rate of growth during a period p
p	time-scaling factor used to compute Z in discrete time
Ψ^*	estimated value of Ψ
β	elasticity of expected inflation with respect to actual price changes in Cagan's 1954 formulation

E	expected inflation in Cagan's 1954 formulation
C	actual change in prices in Cagan's 1954 formulation
α	elasticity of the demand for real balances with respect to expected inflation in Cagan's 1954 formulation
$\bar{\chi}$	elasticity of memorized nominal growth with respect to actual changes in Allais's 1954 formulation
u	memorized nominal growth in Allais's 1954 formulation
K	elasticity of the demand for desired balances with respect to memorized nominal growth in Allais's 1954 formulation
Z_0	initialization parameter, value of Z for $t = 0$
P	a price or a price index
ζ_1	expectations of momentum traders in Smith's formulation
c_1	elasticity of the expectations of momentum traders with respect to price changes in Smith's formulation
q_1	weight given to momentum traders in Smith's formulation
ζ_2	price deviation from fundamental value in Smith's formulation
q_2	weight given to fundamental investors in Smith's formulation
$k(\zeta)$	total investor sentiment function in Smith's formulation
ρ	rate of growth in base money
$\gamma(Z)$	base-money multiplier, a logistic function of Z
a'	parameter in the function γ , setting its minimum value $(1 - a')$
b'	parameter in the function γ , setting its maximum value $(1 + a'b')$
α'	parameter in the function γ , setting the slope of the asymptotic limit of its elasticity with respect to Z
B_0	value of base money for $t = 0$
q	scaling parameter in the money supply function

Chapter 5

Q	volume of transactions
E	nonbank credit in Allais's fundamental equation of monetary dynamics
M_{De}	demand for money in dynamic equilibrium
M_e	supply of money in dynamic equilibrium
x_e	rate of growth in nominal spending in dynamic equilibrium

z_e	dynamic equilibrium rate
Z_e	coefficient of psychological expansion in dynamic equilibrium
V_e	transaction velocity of money in dynamic equilibrium
χ_e	rate of memory decay in dynamic equilibrium
V_0^*	transaction velocity of money in a stationary state
Θ	period of endogenous fluctuations in nominal spending

Chapter 6

x^*	estimated rate of growth in nominal spending
Z^*	estimated coefficient of psychological expansion
K	ratio of aggregate nominal spending to national income, ratio of the transaction velocity of money to its income velocity
v	income velocity of money

Chapter 7

θ	time elapsing between the assessment and the collection of taxes
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Chapter 8

i	psychological rate of interest
j	yield on long-term bonds
i_l	pure long-term interest rate
l_j	liquidity premium on long-term bonds
λ	parameter equal to the ratio of the liquidity premium l_j to the nominal interest j
W	an approximation of aggregate nominal spending
j^*	estimated yield on long-term bonds with respect to χ
μ	ratio of the estimated nominal interest rate j^{**} to z
j^{**}	estimated yield on long-term bonds with respect to z
P	price of a share
d_0	current dividend
r	discount rate of dividends
g^*	expected long-term growth rate of dividend
π	ex-anti equity risk premium

Chapter 9

O_{MD}	outstanding margin debt
M_3	broad money supply
ff	federal funds rate

- x_{SP} return of the S&P 500 index
 x_N return of the NASDAQ index
 P rescaled ratio of margin debt to broad money supply
 O_{MD}/M_3

Chapter 10

- x_i an outcome in a risky prospect
 p_i the probability of outcome x_i
 P a risky prospect consisting of one or several outcomes
 V the psychological value of a risky prospect
 E the mathematical expectation of a risky prospect
 B a neo-Bernoullian index of the psychological value of a risky prospect (ignoring its distribution)
 C an individual's capital
 u cardinal utility
 w decision weights in prospect theory
 v the psychological value of an outcome in prospect theory
 π the function transforming probabilities into decision weights in prospect theory
 μ_l the l th-order moment of a risky prospect
 \bar{v} Allais's cardinal utility (or absolute satisfaction) function
 U_0 an individual's psychological capital
 X the absolute change (gain or loss) in an individual's psychological capital
 U_0^* the statistical estimate of an individual's psychological capital
 $B_{1/2}$ Bernoulli's index for a constant-probability (1/2), variable-gain prospect
 B_{200} Bernoulli's index for a variable-probability, constant-gain (200) prospect
 R the psychological value of a risky prospect according to Allais, a function of its moments

Chapter 11

- χ_0^i rate of memory decay of age group i in a stationary state

Uncertainty, Expectations, and Financial Instability

