This document and the associated file Notation_Guide.xlsx will serve as the official guide to notation used throughout the model. The goal is to make sure variables and parameters have intuitive and consistent notation.

The notation will be grouped into three tables: endogenous variables, exogenous variables, and parameters. Note that other versions of the variables used here will exist. In particular, "hats" over variables (e.g., $\hat{D}_t$) will denote the ratio of the variable to total economic output (e.g., $\frac{D_t}{Y_t}$) and "bars" over variables denote the steady-state version of that variable (e.g., the steady state read interest rate is given by $\bar{r}$). SHOULD WE USE "tilde" for stationarized variables?? It seems to already be taking for the working age population variables...

Table 1: Endogenous Variables in the OSPC Model

Variable	Description
Household	
$U_{j,s,t}$	Discounted lifetime utility for household of lifetime income group j, age s, at time t
$\tilde{c}_{j,s,t}$	Discretionary consumption of composite consumption good by household of lifetime income g
$c_{j,s,t}$	Consumption of composite consumption good by household of lifetime income group j, age s,
$c_{i,j,s,t}$	Consumption of consumption good i by household of lifetime income group j, age s, at time
$n_{j,s,t}$	Labor supply of household of lifetime income group j, age s, at time t
$b_{j,s,t}$	Asset holdings of household of lifetime income group j, age s, at time t
$p_{s,t}$	Price of composite consumption good for household of age s
$p_{i,t}$	Price of consumption good i at time t
Ω	Household beliefs about the distribution of assets
Firms	
$I^C_{m,t}$	Investment by the representative firm of sector C and industry m at time t
$EL^C_{m,t}$	Effective labor demand by the representative firm of sector C and industry m at time t
$X^C_{m,t}$	Production output by the representative firm of sector C and industry m at time t
$K^C_{m,t}$	Capital stock of the representative firm of sector C and industry m at time t
$EARN^C_{m,t}$	Corporate earnings before deprec, corp taxes, and adjust costs, but after property taxes of the representative firm of sector C and industry m at time t
$DIV^C_{m,t}$	Dividend distributions by the representative firm of sector C and industry m at time t
$TE^C_{m,t}$	Total corporate income taxes by the representative firm of sector C and industry m at time t
$\Phi^C_{m,t}$	Investment adjustment costs borne by the representative firm of sector C and industry m at
$B^C_{m,t}$	Debt outstanding for the representative firm of sector C and industry m at time t
$K^{\tau C}_{m,t}$	Tax basis of capital for the representative firm of sector C and industry m at time t
$VN^C_{m,t}$	New equity issues by the representative firm of sector C and industry m at time t
$V^C_{m,t}$	Value of the representative firm of sector C and industry m at time t
$q^C_{m,t}$	Marginal q (change in firm value per dollar of investment) of the representative firm of sector C and industry m at time t
$Q^C_{m,t}$	Average Q of the representative firm of sector C and industry m at time t
$p^C_{m,t}$	Price of output from sector C, industry m, at time t.
Government	
D_t	Government debt at time t
T_H	Total government transfers at time t
G^{subs}_t	Government subsidies to the production of private goods at time t
G^{emp}_t	Government expenditures on employment in the production of public goods at time t
I^G_t	Government investment at time t
K^G_t	Government capital stock at time t
Aggregates and Prices	
r_t	Rate of return on assets at time t
w_t	Wage rate at time t
$BQ_{j,t}$	Aggregate bequests to households of lifetime income group j at time t
$T_{j,s,t}$	Total taxes paid by households of lifetime income group j, age s, at time t
Y_t	Total economic output at time t
Γ_t	Distribution of assets at time t
B_t	Aggregate assets held by households at time t
C_t	Aggregate consumption by households at time t
I_t	Aggregate investment by firms and government at time t
G_t	Total government expenditures (on public goods and subsidies to private goods)
K_t	The total capital stock held by firms and government at time t

Table 2: Exogenous Variables in the OSPC Model

Variable	Description
Household	
$\omega_{s,t}$	The measure of households of age s at time t
N_t	Number of households at time t
$\tilde{N}_t$	Number of working age households at time t
Initial Values	
N_0	Population in initial year
$w_{s,0}$	Fraction of initial population of age s in initial model year
D_0	Government debt in the model's initial period
Γ_1	Initial distribution of assets

Table 3: Parameters in the OSPC Model

Parameter	Description
Demand Side	
Consumer Preferences	
σ	Household coefficient of relative risk aversion on consumption and bequests
χ_b	Utility weight on the utility from bequests
β	Household rate of time preference
I	Number of consumption goods that go into composite good
$\alpha_{i,s}$	Household sub-utility function share parameter on good i for households of age s
$\bar{c}_{i,s}$	Household sub-utility function minimum amount of good i for households of age s
Z	"Transition" matrix relating output of firms to consumption goods (dimesions are $M \times I$)
γ_m	Share parameter for corporate output in industry m
ε_m	Elasticity of substitution of corporate for non-corporate output in industry m
Labor Supply/Ability	
$e_{j,s}$	Effective labor for household of lifetime income type j at age s
J	Number of lifetime income groups for household
λ_j	Fraction of population of lifetime income group J
$\chi_{n,s}$	Utility weight on the disutility of labor supply for households of age s
b	Scale parameter for elliptical function for disutility of labor
k	Shift parameter for elliptical function for disutility of labor
v	Frisch elasticity of labor supply (?)
$\tilde{l}$	Time endowment
Population Dynamics	
E	Number of years from birth to start of economic life
S	Maximum length of economic life
R	Age at which retirment benefits paid out
f_s	Fertility rate at age s
i_s	Immigration rate of individuals of age s
ρ_s	Mortality rate for individuals of age s
Individual Income Tax Code	
A	Coefficient on the quadratic term in the individual income tax function
B	Coefficient on the linear term in the individual income tax function
C	Constant in the individual income tax function
D	Level parameter in the individual income tax function
F	Income factor in the individual income tax function
τ^P	Payroll tax rate
θ_j	Replacement rate for retirement benefits for those in lifetime income group j
τ^{BQ}	Estate tax rate
Supply Side	
Production Function	
γ^C_m	Capital weighting in CES production function in sector C and production industry m
ϵ^C_m	Elasticity of substitution of capital for labor in CES production function in sector C and production industry m
δ^C_m	Rate of economic depreciation on capital stock in the corporate sector in sector C and production industry m
β^C_m	Scaling parameter for quadratic investment adjustment costs in sector C and production industry m
μ^C_m	Steady-state investment rate in sector C and production industry m
Financial Policy	
ζ^C_m	Dividend payout ratio in sector C and industry m
b^C_m	Debt to capital ratio in sector C and industry m
Tax Policy	
τ^b_t	Corporate marginal income tax rate in year t
$\delta^{\tau C}_{m,t}$	Rate of tax depreciation capital in sector C, industry m, year t
$\tau^{pC}_{m,t}$	Property tax rate on capital in sector C, industry m, year t
τ^i_t	Individual income tax rate on interest income in year t
τ^g_t	Individual income tax rate on capital gains in year t
f_e	Dummy variable for full expensing of investment
f_I	Dummy variable for deductibility of corporate interest paid
f_p	Dummy variable for deductibility of repayment of principle on loans
f_b	Dummy variable for inclusion of proceeds of loan in corp income tax base
f_d	Dummy variable for deductibility of depreciation expenses
Population of firms	
M	Number of industries
Ω	"Transition" matrix relating output of firms to the supply of new capital (dimesions are $M \times M$)
Government	
ρ_t	Response rate of government spending on public goods to debt to GDP ratio
Economic Growth	
$g_{n,t}$	Rate of population growth from period $t-1$ to period t
$\tilde{g}_{n,t}$	Rate of growth in working age population from period $t-1$ to period t
g_y	Rate of labor augmenting technological growth
Model Solution	
T	Periods to read the SS in the TPI method
ν	Dampening parameter for TPI method